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Kimberly-Clark Sales and Profits Expand

Latest Report of Kimberly-Clark Corp. Reflects Substantial Gains In Sales and Profits Over Last Year—Paper Mill Employees To Hold State Meeting — Marathon To Erect $100,000 Addition — Other Mill News.

[FROM OUR REGULAR CORRESPONDENT]

APPLETON, Wis., July 24, 1939—Substantial gains in sales and profits over a year ago are reflected in the report of Kimberly-Clark Corporation, Neenah, Wis., issued last week.

Net profit on common stock in the second quarter totalled $515,476, against $275,213 in the same 1938 period, an increase of $240,263, or $1.06 per share against 56 cents. For the first six months of 1939, the net profit was $964,691 as against $710,445, a gain of $254,246, or $1.98 per share against $1.45.

Net sales in the quarter ended June 30 increased $819,815, going from $5,933,655 in the corresponding 1938 period to $6,753,470. For the six months period, the increase was $538,761, with total sales of $13,801,291 as compared with $13,262,530.

Cost of sales in the June quarter amounted to $5,377,564 and gross profit was $1,375,906, as compared with $1,160,423 in 1938. In the six-month period, the cost of sales was $11,012,510 and the gross profit $2,788,781, against a gross of $2,542,774 in the same 1938 period. Profit from operations amounted to $1,610,548 against $1,377,876; total income before bond interest was $1,840,635 against $1,590,335; net income before federal taxes, $1,634,581 against $1,377,835; net income after taxes, $1,314,581 against $1,080,835; net income before preferred dividends, $1,263,581 as compared with $1,009,335.

Net Profit Per Common Share $3.17

Net profit on common in the 12-month period ending June 30 totalled $1,549,251, against $1,553,460 in the preceding year, or $3.17 per common share against $3.18. Net sales in the 12-month period were $27,094,491 against $26,673,372; gross profit, $5,122,558 against $5,076,454, and profit from operations $2,844,147 against $2,947,152.

Commission Files Power Arguments

Written arguments have been filed with the Federal Power Commission at Washington, D. C. to support contentions of the State of Wisconsin that the Wisconsin River, where many paper mills are located, does not come under federal jurisdiction with regard to power development. Briefs filed by John Martin, attorney general of Wisconsin, and Adolph Kannenberg, representing the Wisconsin Public Service Commission, point out the river has had no commerce for 50 years and therefore is not a navigable stream.

The case is based on a declaration of intention of the Wisconsin Public Service Corporation to reconstruct the former Tomahawk Pulp and Paper Company dam on the Wisconsin River near Tomahawk, Wis., so as to supply additional power to the paper mills. It is argued operation of the dam cannot affect navigation where none exists.

Badger Paper Builds New Acid Tank

Construction of a new acid tank has been started by Badger Paper Mills, Inc., Peshtigo, Wis. It will be 25 feet in diameter and 30 feet high. It is to be located between the sulphite room and the boiler plant, and will provide increased capacity for the pulp mill.

Marathon to Erect $100,000 Addition

Estimated cost of the addition to be built to the Menasha Products division of the Marathon Paper Mills Company at Menasha, Wis., is $100,000. The structure will be started as soon as old buildings on the site have been razed. It will be of concrete and brick construction, 220 by 110 feet, and will house the rapidly growing parafilm department.

Paper Mill Employees to Hold Meeting

The Wisconsin Association of Independent Unions, among which are a number in paper mills, will hold a state meeting at Kimberly, Wis., at 8 o'clock Friday evening, July 28. This is the home of the Kimberly Papermill Workers' Union, made up of employees of the Kimberly-Clark Corporation's mill. The principal speaker will be Assemblyman Robert Tehan of Milwaukee, who has been the sponsor of Wisconsin legislation beneficial to independent unions. Various matters concerning wages, hours and working conditions will be discussed. Donald F. Cameron is president of the association.

700 Kimberly-Clark Employees on Picnic

More than 700 employees of the Lakeview mill of Kimberly-Clark Corporation at Neenah, Wis., en-

(Continued on page 14)

Great Lakes Trying to Meet Prorated Level

President Rowe of Great Lakes Paper Co. States Company's Chief Problem Is To Keep Output Satisfactory To Government and Fulfil Customer Contracts—Ontario Paper Co. Builds Employee Houses — Other News.

[FROM OUR REGULAR CORRESPONDENT]

TORONTO, Ont., July 24, 1939—The chief problem of Great Lakes Paper Company, Fort William, Ont., at present is to keep its output at a level satisfactory to the Ontario Government and at the same time fulfil its contractual obligations to its customers, says Hon. Earl Rowe, president.

For the first half of 1939, Great Lakes Paper operated at around 65% of capacity while the prorating mills averaged a little less than 54%. It is this variation that has reawakened interest in the peculiar relations prevailing in the newsprint industry in Canada.

Earlier this year, temporary settlement of differences between newsprint regulations and the scale of operations of Great Lakes was reached but this is understood to have been effective for a short period only. Now negotiations are again under way to arrange some kind of agreement that will apply over a longer period.

While there appear to be good reasons to hope for a reasonably satisfactory settlement, it is difficult to foretell just what form the arrangements will take or when they will be completed. To comply with prorating agreements, Great Lakes Co. would have to turn over from 8% to 10% of its present output to other mills. The company has already turned over the contract obtained from the Milwaukee Journal for 1939 only.

This contract will likely require over 20,000 tons this year.

Pulpwood Peeling Season Nears End

The pulpwood peeling season is now coming to a close and reports received from Northern Ontario are to the effect that only about fifty per cent of the amount of wood that was peeled a year ago has been taken out by the settlers and others this summer. The reason is that the mills are oversupplied with wood from the previous year and have cut down in the quantities which they are buying. This season there was no labor trouble and an abundance of help was available. Prices for wood are about the same as last year with poplar a little higher and spruce not commanding quite so high a figure. The Thompson-Heyland Company, Toronto, who annually make contracts for many thousands of cords to be delivered to mills in New York state, Pennsylvania and Southern Ontario, have made only about sixty per cent of the committments of 1938 and report there is considerable wood in the northern part of the province to be shipped out yet by water and rail.

Cape Terminals Building New Dock

Cape Terminals, Inc., a company organized recently after the purchase of the Cape Vincent Pulpwood Company by Clarence Hall, of Clayton, has had crews working for several weeks building a new dock faced with steel piling. This has been filled with stone and completed and a trestle twelve feet high built on it. The New York Central railway is building sidings near the trestle and as soon as the work is completed the company will be ready to unload boats. Boats coming up the river from the Upper Gulf of St. Lawrence will carry from 1200 to 1600 cords of Canadian pulpwood and lake boats will hold from 2200 to 2500 cords. Advices from Kingston, Ont., say that it is expected more than 200,000 cords of pulpwood will be unloaded this summer for the St. Regis Paper Co., at Deferiet. Other mills which will receive wood are at Dexter, Brownville and Carthage. The nearest other point equipped for unloading pulpwood is Waddington and the completion of facilities for the work will mean considerable reduction in transportation charges for the mills as water transportation is cheaper than rail. The Cape Vincent Pulpwood Company, predecessor to the present firm, was organized last year to receive shipments of pulpwood.

Ontario Paper Co. Builds House

Several additional houses are being built by the Ontario Paper Company at Heron Bay, Ont., to house members of the staff. The company cut about thirty thousand cords of pulpwood last year and the plant at Heron Bay has a capacity of barking and shipping fifty thousand cords per year. The barked wood will be moved to the paper plant of the company at Thorold for the most part by the Sarnia Steamship Co.

W. H. Smith Corp. To Celebrate

W. H. Smith Paper Corporation, 121 Hudson avenue, Albany, N. Y., celebrates its 20th anniversary of Incorporation on August 1, 1939. This well-known paper house was founded on August 1, 1919, by W. H. Smith, its president. The first warehouse was in a small 1-floor building at 118 Hamilton street. A year later its first expansion came when the lease on adjoining property was taken. Increasing business moved the business in 1920 to larger quarters at 29 Green street. In 1923 the Fischell Paper Company was combined with the W. H. Smith Paper Company and the business moved to its present location at 121 Hudson avenue. Again additional warehouse space was needed and, besides the large storage space acquired some years previous in a public warehouse, over 6,000 square feet of warehouse space adjoining the main building was acquired. The officers of W. H. Smith Paper Company are W. H. Smith, president, G. C. Kugler, vice president, Edwin Hourigan, secretary, W. H. McCredie, treasurer. Its fine staff of salesmen well known to the trade, are "Barney" Wood, Clark Simmons, Oscar Hakes, "Bill" Greenough, Edgar Potter, and Milford Veino.

The company is very active in association affairs and enjoys a high standing in the trade.

An anniversary folder "The House That Progress Built" announces its 20th year in business of this progressive paper house.

Chicago Paper Trade Reflects Summer Lull

Midwest Trading Slightly Less Active With Prices Unchanged From Previous Week — Waste Paper Market Weak — United Wall Paper To Start Advertising Campaign—Midwest SAPI Hold Outing—Other News.

[FROM OUR REGULAR CORRESPONDENT]

CHICAGO, Ill., July 24, 1939—The paper industry in the Chicago area showed little signs of any major change during the past week. Prices for the most part were unchanged over the previous week and demand, slightly more encouraging last week, fell slightly behind its earlier pace. There were signs, however, of a material pick up in retail trade which paper executives were inclined to believe would precede a much more pronounced degree of activity for the early fall.

The waste paper market, heretofore classified as "soft", fell into the "weak" category with sufficient supply on hand for all apparent needs. In the general paper market sulphite bonds were reported as showing as significant a strength as any specific group with demand fair and the undertone steady. Kraft demand was equally good though the prices obtained continued far from satisfactory to those facing huge operating costs. Book and cover papers showed no change during the week. Newsprint markets were slow while groundwoods reported only a fair amount of activity but with prospects better for early fall movement.

Link-Belt Development Announced

The Link-Belt Speeder Corporation, a wholly owned subsidiary of the Link-Belt Company, Chicago, has recently been announced by Alfred Kaufman, president of the Link Belt Company. Functioning entirely independently of the Link Belt Company, the Speeder organization will manufacture and sell power operated excavating and materials handling shovels, draglines and cranes including a full line of track type locomotive cranes. The company was formed through a merger of the Speeder Machinery Company of Cedar Rapids, Iowa, with the shovel division of the Link Belt Company. An organizing committee set up a list of directors to serve for the first year, the list including Mr. Kaufman, T. M. Deal who was president of the Speeder Machinery Corporation, Walter Baker, W. C. Carter and H. E. Kellogg. Mr. Kaufman was named chairman of the board, Mr. Deal vice president, Mr. Carter vice president and Mr. Kellogg treasurer. G. H. Olson will act as secretary. The sales force of the Speeder Machinery corporation will be brought to Chicago with headquarters at 301 W. Pershing Road. Production activities will continue in Cedar Rapids.

Industrial Selling of Paper Cups

From several retail outlets has come some complaints as to the procedure of the larger office buildings in Chicago which has resulted in supplying paper drinking cups to all tenants at a "materially reduced price". A letter from one of the building offices to its tenants reads as follows: "In order to enable you to have paper drinking cups when you want them, without the inconvenience of carrying a surplus stock in your office; you can now call our service department and order your cups in lots of one thousand at the reduced price of $2.00 from the building. To those whose requirements necessitate purchases in case lots of 5000, there is a discount of 10%". There thus seems to be entering the paper industry that same type of "industrial selling" which the furniture, hardware appliance and other retail groups have been battling so hard in the past. Naturally, if the procedure of supplying drinking cups was carried on to wrapping paper and office supplies, the paper industry can well recognize what such a development would mean to their own retail outlets.

Chicago Waste Paper Market Weak

Chicago Journal of Commerce listings of waste paper prices this week show the market as weak with Chicago dealer buying prices of mixed papers at .05 to .10, No. 1 mixed, .10 to .15; folded news at .15 to .20; box board, 10 to 15; No. 2 book stock, .20 to .25; old containers at .20 to .25; No. 1 book, .30 to .40; white news blanks, .60 to .70 and No. 1 white shavings, .90 to 1.15.

United Wall Paper to Start Ad. Campaign

The United Wall Paper Factories, Inc., of Chicago, has recently appointed Mays, MacFarland & Company to handle its advertising. Recent announcements by A. J. Browning, president of United Wall Paper, are to the effect that present advertising plans call for one of the most extensive consumer campaigns in the history of the wall paper industry. The company has described 1939 as a good business year and announced its intention of further developing a rapidly increasing consumer demand for wallpaper.

Midwest SAPI Hold Outing

The midwest division of the Salesmens Association of the Paper Industry held its July outing on Friday, July 21, without the assistance of golf chairman George Crafts who is vacationing in Maine. It is reliably reported that Mr. Crafts is getting full strength for the August outing at the LaGrange Country Club which, at this date, looks like one of the outstanding events of the year. In the absence of Mr. Crafts, "Pat" Patterson of the Flambeau Paper Company took care of the "generalship", figured up the prices and otherwise acted effectively as the general chairman.

Book Paper Hearing at Seattle

The hearing in the case of the Federal Trade Commission against the Book Paper Manufacturers' Association at Seattle, Wash., July 22, was rather perfunctory. It involved mainly the Everett Paper Company. They brought out that since they dealt only on the Pacific Coast, their practices in no way affected matters in the East and they consequently felt that they could do whatever conditions warranted. The next hearing is scheduled to be held in San Francisco, Cal., on July 28.

Canada To Rid Forests of Destructive Pest

Quebec Government To Attempt To Exterminate Saw-Fly Which Has Destroyed Thousands of Acres of Trees — Gaspesia Pulp For U. S. Market—Anglo-Newfoundland Co. Adds Improvements — Other Late News.

[FROM OUR REGULAR CORRESPONDENT]

MONTREAL, Que., July 24, 1939—The saw-fly, the greatest insect pest that Canadian foresters know—a pest that has destroyed, and is still destroying thousands of acres of trees in Eastern Canada—has roused governmental authorities to action, and this summer will see the start of a great campaign to rid the forests of this pest. As part of this campaign the Quebec Government's Entomological Bureau has sent 75 young men into thickly-wooded Gaspe, where millions of the insects annually wreak their greatest havoc.

Work of the party, whose members were selected from the ranks of unemployed under the Quebec youth training plan, is not to give the saw-fly actual battle, but to complete the groundwork of the Government's campaign.

Their mission simply is to collect cocoons of the saw-flies, found in some regions in Gaspe Peninsula as thickly as 2,000,000 per acre of spruce, which the insects attack exclusively.

A vast collection of the cocoons will be made and shipped to the Dominion Government's parasite laboratory at Belleville, Ont. There a particular breed of parasite imported from Europe will be injected into the cocoon, acclimatized and prepared for a trip to the Quebec forests.

Once the parasites are healthy enough, the saw-fly cocoons containing them will be shipped back to the spruce forests and spread about the saw-fly breeding grounds.

In little screen-covered containers they will be laid about the spruce groves and once they emerge the fight to save the province thousands of dollars in timber will be on.

How much the spruce destruction by the saw-flies amounts to is unestimated. Steps to prevent that destruction were begun last year in Quebec when importation of the parasites from Europe was made experimentally.

Quebec's natural enemies of the saw-flies are birds and forest rodents but officials of the Government Entomological Department believe they do not eliminate more than 66 per cent of the insects' larvae.

Gaspesia Pulp for U. S. Market

At the annual meeting of the Gaspesia Sulphite Company Frank Humphrey informed the shareholders that as a result of the severe conditions that developed during 1938 the Chandler mill of the company was operated at approximately 50% of capacity, but during that time the quality of production was considerably improved.

The company has been successful, he said, in developing a high grade, unbleached sulphite pulp suitable to the requirements of the United States market. This pulp is coming to be recognized by American consumers as being competitive in quality to Scandinavian pulp.

Due to the prior commitments of American mills for Scandinavian pulp, Mr. Humphrey went on to say, the demand has as yet been poor, but of late there was evidence of improvement.

Anglo-Newfoundland Development Co. has a substantial interest in the Gaspesia Sulphite Co. and along these lines Mr. Humphrey expressed the view that eventually "our investment in this company will prove a profitable one."

Bowater Bond Issue in Montreal

Local security houses here are making a public offering of $800,000 of 4½% first mortgage bonds of Bowater's Newfoundland Pulp and Paper Mills at the price of 102 and accrued interest. This is the company that took over the International Power and Paper Company of Newfoundland. The proceeds of the issue are to be used as part payment for about 4,000 sq. miles of timber limits purchased from the receiver of Reid-Newfoundland Co. The principal and largest parcel of limits purchased is known as the Gander Limits.

Anglo-Newfoundland Development Co.

At the annual meeting of the above company, Frank Humphrey, chairman, stated that the Grand Falls plant had been operated on a substantially reduced scale during 1938, owing to curtailment in the demand for newsprint and the company had taken advantage of the lull to make improvements in plant and machinery, his opinion being that the long-term outlook for the pulp and paper industry was a favorable one. During the year the company's water power development at Grand Falls had been increased by 27,000 h.p. to 52,000 h.p. Other improvements included the modernizing of the No. 6 paper machine to increase the capacity of the mill by 35 tons a day, and the putting into service of the company's new steamer, the S. S. Rothermere.

The balance sheet for 1938 shows the number of shares issued was increased by 115,450 as the result of the exercise of options during the year. The amount of first mortgage debenture stock outstanding was reduced by $251,496 through operation of the sinking fund. Inventories were reduced during the year by $523,530, while the cash balance was increased to $1,246,670 as compared with $798,221 at the end of the previous year.

Plan for Labor Day Celebration

CARTHAGE, N. Y., July 24, 1939 — Announcement is made here that prominent speakers will appear here in connection with the annual Labor Day celebration to be sponsored by the Northern New York District Council of Paper Mill Unions. The main speakers will be Michael Walsh, of Utica, general representative of the American Federation of Labor, and Frank P. Barry, of Albany, a representative of the International Brotherhood of Papermakers. Labor locals from all parts of Northern New York are planning to participate.

Financial News of Pulp and Paper Industry

Abitibi Reports Earnings — Lower Income For Fraser — Mersey Profits Decrease — Rayonier Issues Statement — Mead Shows Increase — Crown Zellerbach, S. D. Warren, Johns-Manville and Sutherland Also Report.

New York Stock Exchange

High, Low and Last for the Week Ending July 26 1939

	High	Low	Last
Armstrong Cork Co.	43¾	41¾	42½
Celotex Corp.	13⅜	12⅞	12⅞
Celotex Corp., pf.	66	65	65
Certain-Teed Products Corp.	8½	7⅞	8
Certain-Teed Products Corp., pf.	32	30½	32
Champion Paper & Fibre Co.	20⅞	19	20½
Champion Paper & Fibre Co., pf.	100	100	100
Congoleum-Nairn Co.	27¼	25⅝	26⅝
Container Corp. of America	12	11	11¾
Continental-Diamond Fibre Co.	7¼	7	7
Crown-Zellerbach Co.	11¼	10⅛	10½
Crown-Zellerbach Co., pf.	81	80½	80½
Flintkote Co.	22½	21¼	21⅞
Robert Gair	2½	2¼	2½
Robert Gair, pf.	9½	9	9
International Paper & Power	10¼	8¾	10⅛
International Paper & Power, pf.	37¾	33½	37⅜
Johns-Manville Corp.	82¼	78½	79½
Johns-Manville Corp., pf.	129½	129½	129½
Kimberly Clark Corp.	30½	27½	29
MacAndrews & Forbes	34	33	34
MacAndrews & Forbes, pf.	130	130	130
Masonite Corp.	43¾	42	43½
Mead Corp.	8¾	8¼	8⅝
Mead Corp., pf.	46½	46½	46½
Paraffine Companies, Inc.	48½	48½	48½
Ruberoid Co.	24	23	23¾
Scott Paper Co.	51½	50¾	51½
Sutherland Paper Co.	26	25	25¾
Union Bag & Paper Corp.	9⅛	8⅛	8⅝
U. S. Gypsum Co.	94½	91½	91½
U. S. Gypsum Co., pf.	174¾	174¾	174¾

New York Curb Exchange

High, Low and Last for the Week Ending July 26 1939

	High	Low	Last
American Box Board Co.	6½	6¼	6¼
Brown Co., pf.	13	13	13
Great Northern Paper	36¼	36¼	36¼
St. Regis Paper Co.	2¼	2⅛	2¼
St. Regis Paper Co., pf.	43½	43½	43½
Taggart Corp.	3⅛	3⅛	3⅛

Abitibi Earns $199,330

[FROM OUR REGULAR CORRESPONDENT]

TORONTO, Ont., July 24, 1939—Abitibi Power and Paper Company Limited earnings for June, 1939, prior to charges for depreciation and for bond interest, including interest on overdue, and unpaid interest, amounted to $199,330. Earnings on the same basis in May were $237,830 and in June, 1938 $331,066.

According to G. T. Clarkson, Toronto, receiver and manager, shipments of newsprint in June amounted to 24,239 tons compared with 27,201 tons in May and 27,493 tons in June, 1938. Present indications are that shipments in July will be about 22,500 tons compared with 22,960 tons in July, 1938.

Shipments of sulphite pulp in June amounted to 2,863 tons, compared with 3,435 tons in May and 2,142 tons in June, 1938. Present indications are that shipments of sulphite pulp in July will be about 2,900 tons as compared with 2,667 tons in July last year.

Fraser Earnings Decline

MONTREAL, Que., July 24, 1939—For the quarter ended June 30, 1939, Fraser Companies Limited reports consolidated earnings, before interest, depreciation and depletion, at $292,076 as compared with $213,854 in the preceding three months and $547,873 in the corresponding period a year ago. After deducting bank interest, special loan interest, bond interest and exchange, there was a balance of $77,872 against a deficit of $4,045 in the previous quarter and a profit of $237,264 a year ago. Depreciation and depletion accounted for $262,408, leaving a net loss of $184,536 compared with a loss of $263,003 in the March quarter and a loss of $33,623 in the June, 1938 period.

For the six months ended June 30, consolidated earnings, before interest, depletion and depreciation, totalled $506,730 against $1,088,052 a year ago. After all charges, including depletion and depreciation, there was a loss of $447,539 compared with a profit of $109,307 in the same six months last year.

Mersey Paper Earns $453,078

[FROM OUR REGULAR CORRESPONDENT]

MONTREAL, Que., July 24, 1939—The annual report of the Mersey Paper Company, Limited, and subsidiaries for the year ended December 31 last, shows a profit of $453,078 after interest but before depreciation and depletion, all of which was written off to these accounts. This compares with profit of $580,706 on the same basis in the preceding period. Gross profit for 1938 was $852,933 compared with $947,243 in 1937 and $824,219 in 1936.

Balance sheet as of December 31, 1938, shows current assets of $2,651,095 and current liabilities of $1,194,169, leaving working capital of $1,456,926 against $1,428,673. Bank loans stand at $677,000 compared with $311,000 at the end of the previous year while inventory stood at $1,617,954 against $1,190,627 at December 31, 1937.

Rayonier Reports $1,176,647

Rayonier, Inc., reports as follows for year to April 30: Net profit, $1,176,647, equal to $1.88 each on 626,205 shares of $2 cumulative preferred stock outstanding, compared with $3,124,703, or $4.99 a share of preferred, and after preferred dividend requirements to $1.94 a share on the common stock. The company's total indebtedness on April 30 last, including $1,849,160 of current liabilities, was $9,162,378, against total indebtedness of $8,493,974 a year earlier, including $4,294,406 of current liabilities. Current assets totaled $6,026,406, against $5,330,325 in preceding year. Cash increased to $2,768,089 from $793,781. Inventories were $2,091,744, against $2,825,627. Sales for the year amounted to $10,049,431, against $17,496,025 in the year ended April 30, 1938.

Mead Corp. Shows Profit

The Mead Corporation and subsidiaries reports as follows for the twenty-four weeks to June 17: Net profit, $157,219, after minority interest, equal to $1.94 each on combined 31,935 shares of no par $6 preferred stock Series A and 49,200 shares of $5.50

Series B preferred stock. In the twenty-four weeks to June 11, 1938, net was $217,459, or less than 1 cent each on the 619,374 shares of common stock then outstanding, after dividend requirements on the preferred. Twelve weeks to June 17: Net profit, $80,109, equal to 99 cents a share on combined preferred stocks, against $77,110, or 95 cents a share, for the preceding twelve weeks and $63,519, or 78 cents a share, on preferred stocks in the twelve weeks to June 11, 1938.

Crown Zellerbach Reports $5,015,390

The Crown Zellerbach Corporation and subsidiaries report as follows for year to April 30: Consolidated net profit after interests of minority stockholders, $5,015,390, equal to $9.47 each on the outstanding $5 preferred stock and $1.04 a share on the common after preferred dividend requirements. Consolidated net profit for previous year was $6,211,414, or $11.72 a preferred share, and $1.57 a common share after preferred dividend requirements. Net sales amounted to $48,339,600, against $49,891,332. Consolidated working capital was $15,770,340, an increase of $1,392,009 over the previous year.

S. D. Warren Net Rises

[FROM OUR REGULAR CORRESPONDENT]

BOSTON, Mass., July 24, 1939—Earnings of S. D. Warren Co. for the six months ended June 30 were up nearly 59 per cent from a year ago, amounting to $139,885, equal to $1.38 a share on the common stock. This compares with net of $88,115, or 87 cents a share in the six months ended June 30, 1938.

Sales in the first six months were up 19 per cent from the same period last year, but average prices were off 7 per cent. Operations were slightly higher on the average.

Johns-Manville Nets $1,078,626

The Johns-Manville Corporation reports as follows for the three months ended June 30: Net income $1,078,626, or $1.12 a share, against $214,578, or 10 cents a common share, in the same period last year; six months ended June 30: Net income, $1,203,744, or $1.11 a common share, against net loss of $24,897 in same period last year; six months' sales, $24,102,068, against $22,360,931.

Sutherland Paper Earns $258,918

The Sutherland Paper Company reports as follows for the past six months to June 30: Net income, $258,918, equal to 90 cents each on 287,000 shares, against $391,506 or $1.36 a share last year. June quarter: Net income, $143,266 or 50 cents a share, against $115,652 or 40 cents a share in preceding quarter and $196,601 or 69 cents a share in June quarter of 1938.

Whitaker Income $70,334

The Whitaker Paper Company for the six months to June 30, report a net income of $70,334, equal after preferred dividends to $1.40 each on 30,188 common shares, against $60,335 or $1.06 a common share last year.

KIMBERLY-CLARK PROFITS EXPAND

(Continued from page 9)

joyed the annual mill picnic with their families Sunday, July 16, at Lakeview Park. Ball games, races and other amusements were enjoyed. Numerous tagged balloons were sent up, and the finder reporting from the farthest distance is to receive a prize of $25. Some reports have come from as far as 150 miles. The Lakeview band, made up of mill employees, entertained.

Employees of the company's mill at Kimberly, Wis., will hold their annual picnic at the village park Sunday, August 20, under auspices of the Kimberly Papermill Workers' Union. A softball game will be one of the numerous amusement features.

Consolidated Engages New Nurse

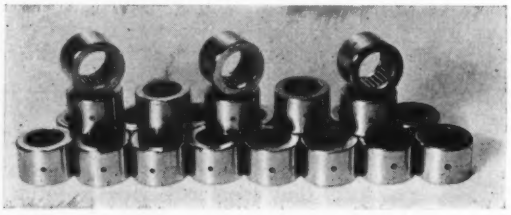
Miss Marion Krogdahl, R. N., of Virginia, Minn., has been engaged as nurse at the Consolidated Water Power and Paper Company, Wisconsin Rapids, Wis., to succeed Mrs. Olive Lewis Kiley who resigned to travel abroad. Miss Krogdahl will be assisted by Miss Eva Hanneman, R. N., of Wisconsin Rapids, under a plan which will provide continuous nursing service for the main mill and the branch mill at Biron, Wis. The new nurse was formerly public health nurse in Pine County, Minn.

Mr. and Mrs. Cooke Celebrate 50th Anniversary

Mr. and Mrs. H. S. Cooke of Kaukauna, Wis., celebrated their fiftieth wedding anniversary last week. Mr. Cooke was associated with the former Outagamie Paper Company at Kaukauna, and devoted 55 years to the business until his retirement in 1934. The mill was purchased by the Patten Paper Company, Ltd., now defunct, and was sold to the city of Kaukauna recently for a municipal power plant.

Bantam Stainless Steel Bearings

The stainless steel bearings manufactured by Bantam Bearings Corporation of South Bend, Ind., have a possible adaptation to paper manufacturing aiding to combat the various strong corrosives present as



NEEDLE ROLLER TYPE BEARINGS

well as corrosive fumes which attack ordinary steel bearings. These stainless steel bearings can be made in almost any desired type. Those represented in the accompanying ilustration are the needle roller type bearings, a completely self-contained unit with the rollers mounted in an outer race.

Boston Paper Men Discuss Conditions

BOSTON, Mass., July 24, 1939—Current conditions were discussed at a meeting of the Fine Paper Division of the National Paper Merchants Association held July 18 at the Boston Chamber of Commerce. F. G. Lockwood, vice-president of the Association in charge of the Fine Paper Division, presided.

MUST *the Best* BE THE *most* EXPENSIVE?

If you believe that because STONITE* Top Press and Smoothing Rolls are vastly superior, they must be extremely high priced, prepare for a pleasant surprise.

The fact is, the average Stonite Roll costs little or no more than an ordinary top press roll of the same size with a 1-inch rubber cover.

On that basis alone, STONITE* deserves serious consideration. But when you also figure that STONITE* Rolls wear infinitely longer, and that their extreme hardness protects them from cracking, chipping, scoring and other damage, they become the cheapest top press rolls you can buy.

For not only does STONITE* guarantee longer, safer, more efficient service life at the lowest cost per year, but the special properties of this patented compound insure a better finish with less sticking, fuzz or pick-ups and fewer breaks.

The performance of more than 1700 STONITE* Rolls now operating in more than 31 countries is undeniable proof of these facts. May we tell you the exact cost of STONITE* Top Press or Smoothing Rolls made to your specifications?

STONITE* Rolls
TOP PRESS AND SMOOTHING

STOWE-WOODWARD, INC. NEWTON UPPER FALLS · MASS.

NEW YORK OFFICE · WOOLWORTH BLDG.

Stowe-Woodward Rolls are made on the West Coast by HUNTINGTON RUBBER MILLS, INC., Seattle, Washington

Makers of **WHITE STAR** *Rubber Covered Rolls,* **TANNITE** *Couch Rolls*
STONITE *Top Press and Smoothing Rolls—All by the* **COREWELD** *Process*

Obituary

Herman C. Macaulay

Herman C. Macaulay, 55, well known in the paper industry for thirty years, died from a sudden heart attack on June 6.

Mr. Macaulay started work in the Rumford, Maine mill of the International Paper Company in 1907. His advancement was steady from steam plant foreman to mill superintendent, from which position he resigned in 1931. In that year he became associated with the Longview Fibre Company, Longview, Wash., and shortly assumed the duties of personnel manager and safety supervisor, which position he held at the time of his death.

Possessing a friendly personality, Mr. Macaulay made many friends among the superintendents and employees of mills and his knowledge of men was reflected in the articles which he contributed to the PAPER TRADE JOURNAL.

Surviving are his widow, a daughter Virginia J., of Longview, and two sons, Clayton C. of Longview and Kenneth E. of Los Angeles, Calif.

Knut Lundahl

Knut Lundahl vice-president and director of the Cellulose Sales Company, Inc., 250 Park Avenue, New York, died July 17th, in Stockholm, Sweden, while on a business trip. Mr. Lundahl was born in Gothenburg, Sweden, December 13, 1888.

After completing his studies at the Commercial College in Gothenburg, he entered the paper business, in the service of the Munksjö Mill, one of the oldest in Sweden.

After having spent several years in other lines, both in Sweden and other countries, he again became associated with the paper and woodpulp business, and with the formation of the Swedish Cellulose Company, Stockholm, in 1929, became connected with that company as their special representative in New York and subsequently returned to the head office in Stockholm, as Assistant Manager and later Manager of Sales for the American market. He remained with that company until assuming the position as vice-president of the Cellulose Sales Company, in September 1938.

During the years of his association with the woodpulp and paper business, both here and in Sweden, Mr. Lundahl made a host of friends, who will be sorry to learn of his passing.

Mr. Lundahl, who was a bachelor, was a member of the Metropolitan Club in New York, and is survived by two brothers, who reside in Stockholm, Sweden.

Charles Wilson Luke

FALMOUTH, Mass., July 25, 1939—Charles Wilson Luke, 54, a director of the West Virginia Pulp and Paper Company, died Saturday at his summer home here. His winter home was on Park avenue, New York.

Born in Louisville, Ky., son of John Guthrie Luke and Ella Hope Green Luke, he attended Lawrenceville Academy in Lawrenceville, N. J., and was graduated from Princeton University in 1908.

He was a member of the University Club, the Uptown Club, St. Andrew's Society and St. James Church, all of New York.

He leaves his widow, the former Josephine Buckley, whom he married in 1922, a son, Richard Hannah Luke by a previous marriage, and two daughters, the Misses Therese Wilson Luke and Joan Buckley Luke.

Funeral services were held in St. James Church, New York, Tuesday afternoon at 3 o'clock, followed by private burial services in Woodlawn cemetery there.

National Cellulose Stock Involved

A detailed account of how Albert D. Lasker, former president of the advertising firm of Lord & Thomas, made a $250,000 loan involving stock of the National Cellulose Company that found its way into a private enterprise of former Federal Judge Martin T. Manton while the judge had before him litigation involving a client of the advertising firm was given in Federal court in New York City Monday by Mr. Lasker.

United States Attorney John T. Cahill told Federal Judge John C. Knox, who is presiding at the hearing, that in the opinion of the government "the only person whose conduct is consistent with his testimony of what took place is Albert D. Lasker of the firm of Lord & Thomas, who, it seems to us, has been grossly misused in the situation, and in fairness to them I think it should publicly be said that we find absolutely no ground for criticism of the conduct of Lord & Thomas."

The present hearing is one of the few disciplinary proceedings against members of the bar to be held in public in New York City. Louis S. Levy and Paul M. Hahn are accused of conduct unbecoming attorneys, and the government seeks their disbarment or censure for their alleged participation in the $250,000 transaction. Mr. Levy was a member of the firm of Stanchfield & Levy, and Mr. Hahn was a vice president of the American Tobacco Company.

Hammermill Honors Employees

ERIE, Pa., July 24, 1939—The annual picnic honoring Hammermill Paper Company employees with 20 and more years of service took place on Sunday afternoon at the Glenhill farm home of President Ernest R. Behrend.

Three hundred Erie men and women—all members of the Hammermill Paper Company's honor roll—attended this outing at which both President Behrend and General Manager Norman W. Wilson of the Hammermill Paper Company spoke.

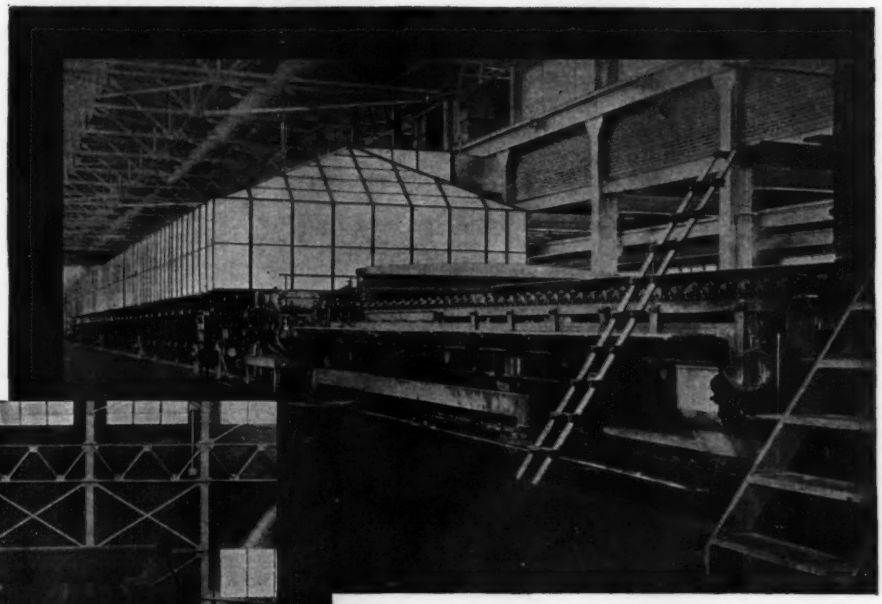
Special honors were awarded to a half-hundred Erieites who joined the honor roll in 1939. Those men and women received honor diplomas and gold watches and shares of company stock.

Philadelphia Personals

PHILADELPHIA, Pa., July 24, 1939—Morgan H. Thomas, president of Garrett-Buchanan Company, accompanied by Mrs. Thomas, sailed for Europe for an extended trip.

John Conradi of D. L. Ward Company, is back at his desk after three weeks of severe illness. It will be recalled that Mr. Conradi celebrated his 50th anniversary in the paper business about two years ago.

THE BELOIT *Removable Fourdrinier*



● Wire is strung in aisle while machine is in operation, if desired.

● Fourdrinier pit can be washed out while wire is being installed.

● Wire bundle is taken from shipping box and mounted directly in carriage—no chucks to apply—no further handling as bundle is unreeled as carriage moves along to form wire loop.

● All wire poles are mounted in carriage before loop is formed. Inside poles are inserted inside the wire.

● Safest — most convenient — quickest method of installing Fourdrinier wire.

THE BELOIT WAY IS THE MODERN WAY

BELOIT IRON WORKS PAPER MACHY BELOIT, WIS. U.S.A.

Indianapolis Demand Quiet

[FROM OUR REGULAR CORRESPONDENT]

INDIANAPOLIS, Ind., July 24, 1939—Little of a favorable nature can be said of the paper market in this section during the last week or so. The usual mid-summer dullness seems to have hit all lines except the building and roofing paper field. This field continues to be one of the best in the list and from all indications will remain exceptionally good until cold weather finally curtails the industry. Jobbers of building papers say that the first six months' business this year was the largest since 1929 and the end is not in sight. Stocks in retailers' hands, while not large, are well balanced and are moving readily.

Demand for newsprint seems to be holding its own with the volume fairly well balanced between the larger city papers and the rural communities. Volume is somewhat below what it was a year ago but there are indications, according to jobbers, that it will be accelerated during the last half of the year.

Fine paper demand has fallen off slightly, mostly due to seasonal influences. Books, ledgers and covers all have felt the slump. There are some inquiries which may lead to orders by the first of the month. One favorable feature however, is the fact that prices are being firmly held and no disturbing factors can be seen at the present time.

Container men report a fair demand, but here also has been some decline, with the exception of containers going to the milk and ice cream trade. This demand continues very heavy. Demand for summer specialties dropped slightly following the Fourth of July holiday, but during the last week there was considerable buying.

Kraft demand has dropped somewhat and the same is true of ground woods.

Paper stock demand has dropped and prices are low. The rag market also is reported dull but there has been some call for better grade stock. Local warehouses have huge stocks on hand waiting for a favorable break in prices.

France Subsidizes Newsprint Exports

French exporters of newsprint paper are to receive a Government subsidy, according to a report received in the Forest Products Division, Department of Commerce, from the American Commercial Attache, Paris.

A recent official decree authorized a credit of 8,000,000 francs ($212,000) for this purpose, the subsidy to be retroactive for exports made since the beginning of the year. The decree fixes the amount of the subsidy at 25 francs per 100 kilograms ($0.66 per 220 pounds) of newsprint exported.

Another decree promulgated late in 1938 established a credit of 9,000,000 francs ($238,500) as a subsidy for the utilization of French newsprint paper by French publishers. The rate of this aid was fixed at 5 francs per 100 kilograms ($0.13 per 220 pounds) of paper delivered to French newspapers or periodical publications.

In April of this year, the United States imported a negligible quantity of newsprint paper from France, the first shipment of this sort received in more than ten years. It is not expected that any appreciable amount of newsprint paper will be imported into the United States as a result of the subsidization of French exports, according to the Forest Products Division.

E. S. Lansing Heads Machinery Firm

WATERTOWN, N, Y., July 24, 1939—Edward S. Lansing, former vice president and director of the Bagley & Sewall company, manufacturers of paper and pulp making machinery, is the head and principal shareholder of the Lansing Machinery Company, Inc., city, which has just been incorporated under the laws of New York state through Attorneys Harris & Taylor.

The charter for the new company is perpetual and is broad in its scope. The capitalization is fixed at $100,000 consisting of 500 shares of $100 preferred stock and 10,000 shares of $5 common. The directorate may consist of Mr. Lansing, Mrs. Sara George Lansing and Roswell F. Taylor.

Under the charter the company may design, lay out, plan and make specifications for paper mills, paper and pulp making machinery of all types, employ a corps of draughtsmen to make such designs; engage in welding, brazing and cutting all kinds of metal, make castings, do wrought-iron work; manufacture power transmission machinery, deal in engines, machines of all kinds, make rolling mill machinery, do work in metal for various automobile uses, deal in paper and pulp products.

Mr. Lansing, who has subscribed for 2,500 shares of the stock, was connected with the Bagley & Sewall company until about a year ago, when he retired. His father, the late Stuart D. Lansing, was for several years head of that company and prior to that his grandfather, the late George A. Bagley, was its head and one of the company's founders.

Mrs. Sara G. Lansing and Mr. Taylor have subscribed for ten shares each of the stock in the new company.

Paper Bought Under Walsh-Healey Act

WASHINGTON, D. C., July 26, 1939—Secretary of Labor Perkins stated last week that contracts valued at over a billion dollars and numbering 14,777 had been reported to the Division of Public Contracts of her Department as being subject to the Walsh-Healey Act from September 28, 1936, when the Act became effective until June 30 of this year. Her statement said that she had approved minimum wages recommended by the Public Contracts Board in 26 industries.

Included in these 14,777 contracts were 382 for paper and allied products valued at $25,308,194.66 which were 2.53 per cent of the total number of contracts entered into.

Details of the paper and allied products included: 156 contracts for paper valued at $14,840,733.11; 34 contracts for envelopes valued at $3,191,963.49; 19 contracts for cardboard valued at $348,522.69; and 173 contracts for miscellaneous paper valued at $6,926,975.37.

Now Plastic Coating Corp.

The name of the Beveridge-Marvellum Company, Holyoke, Mass., has been changed to The Plastic Coating Corporation. As of August 1, 1939 all business of this corporation will be carried on under the new name. The management and personnel will remain as heretofore. William J. Warner is president of the corporation.

Government Paper Bids and Awards

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., July 26, 1939—The Government Printing Office has received the following bids for 69,000 pounds (300,000 sheets) of 50 per cent rag, 38 x 48, 230 lbs., lithograph map paper; R. P. Andrews Paper Company, 9.37 cents; Barton, Duer & Koch Paper Company, 9.37 cents; Mathers-Lamm Paper Company, 9.39 cents; Graham Paper Company, 9.37 cents; Whitaker Paper Company, 9.48 cents; Mudge Paper Company, 9.425 and 9.335 cents.

For 25,900 pounds (100,000 sheets) of 50 per cent rag, 36 x 48, 259 lbs., lithograph finish map paper; R. P. Andrews Paper Company, 9.57 cents; Barton, Duer & Koch Paper Company, 9.37 cents; Mathers-Lamm Paper Company, 9.39 cents; Graham Paper Company, 9.37 cents; Whitaker Paper Company, 9.48 cents; and Mudge Paper Company, 9.425 and 9.32 cents.

For 5,550 pounds (30,000 sheets) of 36 x 48, 185 lbs., 50 per cent rag, lithograph finish paper; R. P. Andrews Paper Company, 9.57 cents; Barton, Duer & Koch Paper Company, 9.75 cents; Mathers-Lamm Paper Company, 9.39 cents; Graham Paper Company, 9.37 cents; Whitaker Paper Company, 9.48 cents; and Mudge Paper Company, 9.425 cents.

Link Paper Company will furnish 5,000 pounds of oiled manila tympan paper in 38 inch rolls at 7.4 cents. Whitaker Paper Company will furnish 102,600 sheets of 19½ x 26½ buff gummed paper at $6.935 per M sheets. Garratt-Buchanan will furnish 8,000 sheets of 100 per cent rag, writing mourning paper at $11 per M sheets. Bids for all of these items were received on July 7.

Sherman Counsel Get Fee Allowance

[FROM OUR REGULAR CORRESPONDENT]

GREAT BEND, N. Y., July 21, 1939—Federal Judge Bryant has allowed the claim of Cosgrove, Harter, Scanlon & Wright for services listed as $2,000 and $352.85 expenses as counsel for the Sherman Paper Company, of this place, during the period from October, 1937, to February, 1938, when the concern was attempting to reorganize under the bankruptcy law. O. Palmer Barnes, as temporary trustee for the concern during the same period, was also allowed $400. The case came before Judge Bryant at his chambers in Malone early this week when Attorney Daniel Scanlon appeared for the law firm of Cosgrove, Harter, Scanlon & Wright. Attorney Claude Dunk, attorney for the trustee, O. Palmer Barnes, appeared in the interest of the creditors and no objection was made to the application for the allowances.

Bulkley, Dunton Increases Sales Staff

The Bulkley, Dunton Pulp Company announce that Milton R. Bailey of Kalamazoo will join their sales organization in the Middle West early in August.

Mr. Bailey has been associated with the American National Bank of Kalamazoo as vice-president and in joining Bulkley Dunton he brings with him a record of able business conduct and a varied experience that will be of great value in serving the paper industry of the mid-west.

He will be closely associated with Roger Egan and Rex Vincent, completing a combination of able technical and business experience to serve Bulkley Dunton's customers.

Now Kidder Press Co., Inc.

An announcement from Dover, N. H., states that the name of the firm formerly known as U. P. M.-Kidder Press Company, Inc., has been changed to Kidder Press Company, Inc., effective July 1.

Company officials state that this change in name is for convenience only, and reflects no change in organization, personnel or policy. The initials "U. P. M." had reference to the United Printing Machinery Company which had been joined to the original Kidder Press Manufacturing Company. The latter company was founded in 1876 by Wellington Parker Kidder, the originator of automatic feeding.

This company manufactures rotary presses for the converting trade, aniline and gravure presses, bronzing machines, and special presses for special purposes. Other products include slitters, roll winders and the Chapman Electric Neutralizer. Factory and main office are at Dover, N. H., and there are sales offices in New York, Chicago, and Toronto.

New Paper Mill Planned at Uruguay

Construction of a new paper mill at Mercedes, Soriano, Uruguay, for the production of chemical pulp from wheat straw and for the manufacture of paper has been reported to the Forest Products Division of the Department of Commerce.

Uruguay, which imported 2,695 tons of wood pulp last year received 2,004 tons from Germany. The country at present has 43 firms dealing in paper. One large company controls two-thirds of all the paper mills in the country.

Capital for the construction of the new mill originated in Uruguay and Argentina. Approximately $351,500 has been subscribed for the mill, pulp and paper machinery which has already been purchased in Europe.

New Mathieson Alkali Plant

The Mathieson Alkali Works, Inc., New York, N. Y., has work in progress on new plant at its works at Lake Charles, La., for the production of synthetic salt cake (sodium sulphate) under a new process, with output designed primarily for the paper mills in Southern area. New plant will develop a large capacity, estimated to be sufficient to furnish all requirements for mills in the districts noted and, it is stated, will make these plants independent of imported salt cake, with definite superiority in the domestic material. The new plant is scheduled to be ready for operation in near future.

Victor Coty Leaves for Newfoundland

[FROM OUR REGULAR CORRESPONDENT]

WATERTOWN, N. Y., July 24, 1939—J. Victor Coty, secretary-treasurer of the Coty Machine Company, left last week by motor for the upper part of Newfoundland. He plans to spend several weeks in that section taking motion pictures of wild life to be used in future lectures. His present adventure will take him into a region where there is said to be the greatest variety of wild life outside of Alaska. Armed with the finest of motion cameras and a large supply of film as well as the necessary clothing, rods, reels and fishing equipment he expects to have a very successful journey.

CONSTRUCTION NEWS

A Summary of Vital Facts Regarding Construction, Financing and Operation of Pulp and Paper Mills

General Construction News

Erie, Pa. — The Erie Corrugated Paper Box Company, 922 Bacon street, manufacturer of corrugated boxes and containers, has approved plans for new addition to plant, to be two-story and basement, 100 x 200 feet, estimated to cost over $50,000, with equipment, It will be equipped for considerable increase in present capacity. General erection contract has been awarded to E. E. Austin & Sons, Twentieth and Reed streets, Erie, and work will be placed under way at once.

Buffalo, N. Y. — The Hilliard Envelope and Printing Company, Inc., recently organized with capital of 200 shares of stock, no par value, will operate a local converting plant for the manufacture of envelopes and other commercial paper products. It is understood that new company will take over and succeed to the H. W. Hilliard Company, Inc., specializing in similar paper goods, with local plant at 2665 Main street. New organization is represented by Babcock, Sullivan & Weaver, 1016 Ellicott Square, Buffalo, attorneys.

Plattsburg, N. Y. — The Imperial Paper and Color Corporation, Paper Mill Division, Underwood avenue, manufacturer of wallpapers and kindred paper stocks, has plans under way for new addition to mill, to be one-story, reported to cost approximately $50,000, with equipment. It is proposed to begin work in near future.

Menasha, Wis. — The Marathon Paper Mills Company, Rothschild, Wis., manufacturer of waxed and other processed papers, box board products, etc., has begun razing buildings on River street, Menasha, located on site to be used for new addition to branch mill at that place. New structure will be two-story, and basement, 110 x 220 feet, and is reported to cost over $80,000, including equipment. Work on superstructure is scheduled to begin soon. Company recently has begun operations in new mill unit at Rothschild for production of lignin material, a new byproduct utilizing the lignin or non-fibrous part of pulp wood, to be used for plastics manufacture. The new mill has a rated capacity for extracting about 25 tons of lignin per day from pulp mill liquors, and will run on maximum output schedule. It is said that the process used is the first successful method for the production of a pure lignin raw material in quantity at low cost.

St. Louis, Mo. — The Reineke Wall Paper Company, 2137 Gravois avenue, has awarded general contract to William Reiter, 523-A Eiler avenue, for one-story and basement addition, to be used for storage and distribution. Work will be placed under way at once. New structure will cost close to $35,000, with equipment. O. W. Stiegemeyer, 4412 Lindell boulevard, St. Louis, is architect.

Long Island City, New York, N. Y.—Kindred, MacLean & Company, Inc., 30 Ferry street, New York, manufacturer of paper products, with lithographing plant, has leased space in building occupying block front on Twenty-second street from Forty-third to Forty-fourth avenue, Long Island City, totaling about 30,000 square feet of floor space, and will use for company plant, removing to new location and expanding capacity.

Rhinelander, Wis. — The Rhinelander Paper Company, manufacturer of glassine, greaseproof and other paper stocks, is awarding miscellaneous subcontracts for new addition to mill, recently referred to in these columns, and will proceed with superstructure at once. An award for structural steel has been made to the Vulcan Manufacturing Company, Fond du Lac, Wis.; and for reinforcing steel to Cook & Brown Lime Company, Oshkosh, Wis. New structure will be two-story, about 50 x 94 feet, and will be used in part for laboratory service, with offices and other facilities. Cost reported about $40,000, including equipment. C. R. Meyer & Sons Company, 50 State street, Oshkosh, is general contractor.

Rocky Hill, Conn.—The Hartford Rayon Corporation, Rocky Hill, manufacturer of cellulose rayon products, has plans under way for new one-story addition to mill, to be equipped as a recovery plant for production of salts. It is estimated to cost close to $50,000, with machinery. Company also will build a new power house at mill, estimated to cost approximately $125,000 with generator unit, boilers and auxiliary equipment, designed to provide complete power requirements at mill. Arrangements have been made for an RFC loan in amount of $400,000, to provide funds for expansion noted and general operations.

South Bend, Ind.—United States Gypsum Company, 300 West Adams street, Chicago, Ill., manufacturer of wall board, plaster board and kindred products, is planning early rebuilding of portion of branch mill at South Bend, recently destroyed by fire with loss of about $50,000. Plant is operated as the McHenry-Millhouse Division of company.

Stafford, Conn. — The American Fibre Mills, Inc., recently organized with capital of $25,000, plans early operation of local mill for the manufacture of fiber products. New company is headed by William Maegerle, 99 Riverview avenue, Tarrytown, N. Y.; and William Goernemann, 302 Marion street, Brooklyn, N. Y.

Columbus, Ohio — The Central Ohio Paper Company, 226 North Fifth street, commercial paper products, has approved plans for new one-story addition, 50 x 150 feet, to be used for storage and distributing service. It is estimated to cost close to $35,000, with equipment. General erection contract has been awarded to the Heckart Construction Company, 17 South High street, Columbus, and work will be placed under way at once.

Corner Brook, Newfoundland—Bowater's Newfoundland Pulp and Paper Mills, Ltd., manufacturer of newsprint, has preliminary plans under way for new addition to mill, to be used for expansion in sulphite pulp division. It will be one and multi-story, reported to cost over $300,000, with equipment.

New Companies

Malden, Mass.—The Bay State Paper Company, Inc., 551 Cross street, has been incorporated with capital of $25,000, to manufacture and deal in paper products. Robert Carpe is president of company.

New York, N. Y. — The Waste Paper Packers, Inc., has been organized with capital of $20,000, to deal in waste paper products. New company is represented by Lilian G. Unger, 44 West Fortieth street, New York, attorney.

Camden, N. J.—The Doreda Greeting Card and Novelty Company has been incorporated with capital of 2500 shares of stock, no par value, to manufacture and deal in paper specialties of various kinds. New company is represented by Albert B. Melnik, Camden, attorney.

New York, N. Y.—The Specialty Converters, Inc., care of the Corporation Trust Company, Industrial Trust Building, Wilmington, Del., representative, has been chartered under Delaware laws, with capital of 10,000 shares of stock, no par value, to manufacture and deal in paper products of various kinds. New company has arranged for immediate change of name to Laiceps, Inc.

New V-Belt Data Book by Manhattan

For machine designers and engineers designing V-belt drives, the Manhattan Rubber Manufacturing Division of Raybestos-Manhattan, Inc., 94 Townsend street, Passaic, N. J. has just published a new engineering data book. The book is divided into two parts. The first part covers standard drives eliminating the necessity of working out calculations, and the second, sheave factors for designing new or special drives. It also contains belt comparison tables and other general information. Engineers, designers, jobbers, and instructors may obtain the book by writing the manufacturer.

Raise Crane from River

OGDENSBURG, N. Y., July 24, 1939—Workmen have succeeded in raising the new 40-ton crane of the Algonquin Paper Company which had been at the bottom of the St. Lawrence River for several days. The crane was drawn into the shipyard of the company late last week. Two steamboats were used and chains were fastened to it by a diver. After raising it from its resting place the boats took it to a shipyard where it was placed upon a marine carriage and drawn up to the shore. The crane, one of four owned by the company, will be used to unload pulpwood from the boats. It is valued at $7,000.

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• BRIGHTNESS
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Ronald G. Macdonald
Editor Technical Section

Lynne M. Lamm
Washington Correspondent

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COMING EVENTS IN PAPER INDUSTRY

TECHNICAL ASSOCIATION OF THE PULP AND PAPER INDUSTRY, Fall Meeting, Syracuse Hotel, Syracuse, N. Y., September 12-14.

NEW ENGLAND SECTION. Technical Association of the Pulp and Paper Industry—Third Friday of each month at the Roger Smith Hotel, Holyoke, Mass.

DELAWARE VALLEY SECTION. Technical Association of the Pulp and Paper Industry—Second Friday of each month at the Engineers Club, Philadelphia, Pa.

LAKE STATES SECTION. Technical Association of the Pulp and Paper Industry—Second Tuesday of each month at the Conway Hotel, Appleton, Wis.

KALAMAZOO VALLEY SECTION. Technical Association of the Pulp and Paper Industry—First Thursday of each month at the Park, American Hotel, Kalamazoo, Mich.

NATIONAL SAFETY COUNCIL, PAPER AND PULP SECTION, Annual Meeting, Atlantic City, N. J. October 16-20.

MACHINERY AND PROGRESS

In this changing world in which old patterns are constantly being replaced with new, the complexity of the development of what many observers of the shifting scene term technological progress, is frequently cited as the chief cause of unemployment. In discussing so controversial a subject differences of opinion are certain to arise, but the consensus of opinion seems to be that machinery has contributed far more to the well-being of the present age than any other economic factor.

A thoughtful discussion of this topic appears in "Machinery's Part in Future Social Progress," written by A. W. Rucker and N. W. Pickering and published in booklet form by the Farrel-Birmingham Company, of Ansonia, Conn. The authors assert that the present wave of anti-machine propaganda, which claims unemployment is increased by technological developments involving the increased use of machinery, is based on fallacious assumptions. The authors describe the several fallacies underlying the claim of the anti-mechanization proponents and state that displacement of labor at the points of machine use is more than counterbalanced by the addition of labor at the points of machine construction, transportation, installation, maintenance and replacement.

The opinions of men prominent in the Roosevelt Administration have often placed upon technological progress the blame for creating unemployment. The authors quote: " 'Science and invention are to blame for the present unemployment in America'—Senator Joseph O'Mahoney. " 'As time goes on there will be more and more men unable to find employment for technological reasons'—Harold L. Ickes. " 'There is nothing to the proposition that labor-saving devices put more people to work'—Representative Hatton W. Summers."

The authors ask, "From what source comes the fuel for the motive power behind the anti-machine propaganda? It is not in the facts, for the facts are that to provide today even the standard of living of 1929 we have neither the mechanical equipment in place nor the skilled labor supply necessary. If that really proves astonishing, it is only necessary to reflect that from 1929 to the end of 1937 our population has increased some 5.7 per cent. In the latter year, our manufacturing output showed a decline of 14.5 per cent from the former period, loose talk about mechanization to the contrary notwithstanding. To provide for our larger population the same standard of living in finished products provided in 1929 would have required an output some 24 per cent greater in 1937 than that actually realized.

"It would also have required approximately 2,058,000 additional factory wage earners, employed for the 1937 average of working hours. That is significant; such an addition to factory employment would have meant the highest employment on record, numerically and percentagewise to population. Factory employment in 1929 was 7.1 per cent of total population and that of 1937, only 6.6 per cent. However, had output in 1937 equalled 1929 and the shorter hours of 1937 remained unchanged, some 2,058,000 more employers would have been required, or 8.1 per cent of total population. At no time in the past have we reached either that percentage or numerical total of factory employment."

In pointing out the absurdity of the deductions of the anti-machine school of thought, the authors state in part: "If the theory, in the economic sense, were really true, certain natural consequences would also have to be true, and the anti-machine school assumes they are true. For instance: It is almost compelled that were machinery causing unemployment in the sense of job reduction, that the number of persons employed per manufacturing concerns should show a declining trend. Now, as a matter of fact, the reverse is the case; since 1933, average employment per going firm has ranged slightly upward and not downward as required by the anti-machine theory. Employment per going concern as found by the U. S. Census of Manufactures is as follows: 1929, 42.0 persons; 1933, 42.5 persons; 1935, 43.7 persons; 1937, 51.4 persons.

"When this type of test is applied to the theory its weakness becomes more and more apparent. We may continue the test by asking that the theory explain certain other facts, as for instance: For unemployment to be caused by mechanization requires that the periods of the greatest increase in unemployment coincide, or nearly so, with periods of the largest

expansion in machinery in place. From the theory, it should follow that the years 1930-1933, in which unemployment increased so rapidly, were the years when machinery installed also increased rapidly. Actually, of course, new machinery installed dropped in those years to an all-time low, or nearly so. Again, the theory would require that the gain in employment between 1933 and 1935-1937, would be accompanied by a decline in new machinery installations. Here also the facts are at variance with the theory and cannot be explained by it. Employment and machinery installations increased together in those years.

"Allied to the foregoing assumption is another upon which those who oppose progress in mechanization rely heavily. If the theory of machine-made unemployment be true in an economic sense, it should logically follow that the most efficient industries are those in which employment shows the greatest deterioration. Readers will recall our study of this question two years ago (Booklet No. 21, Productivity as a remedy for inflation) wherein data from Federal sources revealed that the greatest gains in employment over the long-term occur in those industries employing the fewest man-hours per unit production, and the greatest declines in employment occur in the industries with relatively least efficiency in terms of man-hours per unit of output. In fine, the anti-machine theory predicts an outcome at variance with the facts which actually transpired and thus fails to meet another important test of a theory's validity."

Book Paper Hearing at Spokane

The Federal investigation of the Book Paper Manufacturers' Association in its attempt to prove the existence of a conspiracy to control book paper prices in violation of the fair trade practices act, was resumed at Spokane, Wash. on July 17. The Federal Government at this hearing failed to bring out any evidence of a violation of the Federal Trade Commission Act by the Inland Empire Paper Company.

In testifying, A. W. Witherspoon, president of the Inland Empire Paper Company, stated that he was called in to look after the financial affairs of the Inland Empire Paper Company and to work out some plan of reorganization. He stated he had nothing to do about selling or pricing paper. C. A. Buckland, general manager of the Inland Empire Paper Company testified that the amount of book paper produced by the Inland Empire Paper Company was seventeen-one-thousandths-of-one per cent in relation to that company's total tonnage. Mr. Buckland said that all of the company's prices were determined by competition and that all paper was sold on the Pacific Coast, adding that the company was losing money on all of it.

R. E. Canfield and Edward Burling acting counsel for the Book Manufacturers' Association stated that there was not the slightest degree of evidence produced and motioned that the case against the Inland Empire Paper Company be dismissed.

The hearing was adjourned to resume at Seattle, Wash. on July 21.

Production Ratio Report

These statistics are based upon paper production reports to the American Paper and Pulp Association.

COMPARATIVE MONTHLY SUMMARIES[1]

Months	1939	1938	1937	1936	1935	1934
January	77.5%	63.9%	90.3%	76.1%	65.8%	.....
February	81.7%	68.7%	90.1%	77.9%	70.0%	.....
March	84.0%	69.6%	90.3%	76.0%	70.5%	.....
April	82.9%	68.3%	92.1%	82.3%	70.0%	.....
May	80.2%	69.0%	90.6%	81.6%	69.4%	.....
June	79.4%	66.0%	87.3%	80.7%	72.3%	.....
July	.....	72.0%	81.8%	77.3%	64.9%	.....
August	.....	77.2%	82.9%	81.5%	70.9%	.....
September	.....	76.3%	78.6%	80.5%	71.9%	58.2%
October	.....	82.5%	73.5%	87.6%	75.6%	64.7%
November	.....	79.6%	61.9%	88.0%	75.3%	61.7%
December	.....	74.4%	54.5%	85.9%	71.2%	59.6%
Year Average..	.....	72.3%	80.6%	81.3%	70.5%	.....
First 28 weeks..	80.1%	67.6%	89.2%	78.7%	68.8%	.....

COMPARATIVE WEEKLY SUMMARIES[1]

CURRENT WEEKS, 1939		CORRESPONDING WEEKS, 1938	
June 10	79.2%	June 11	64.9%
June 17	78.8%	June 18	66.1%
June 24	79.0%	June 25	67.7%
July 1	80.6%	July 2	68.8%
July 8	55.7%	July 9	58.9%
July 15	78.8%	July 16	75.7%

The following statistics show the number of mills reporting by ratio groups:

NUMBER OF MILLS REPORTING—CURRENT WEEKS

Ratio Limits	June 10, 1939	June 17, 1939	June 24, 1939	July 1, 1939	July 8, 1939	July 15, 1939
0% to 50%	68	73	79	63	135	51
51% to 100%	238	232	226	235	151	164
Total Mills Reporting..	306	305	305	298	286	215

Paperboard Operating Ratios

Per cents of operation based on "Inch-Hours" reported to the National Paperboard Association.

Year	Jan.	Feb.	Mar.	Apr.	May	June	July
1935	62%	68%	68%	63%	61%	66%	62%
1936	62%	67%	67%	70%	69%	70%	69%
1937	80%	86%	86%	88%	85%	77%	66%
1938	54%	60%	61%	57%	58%	56%	57%
1939	60%	67%	71%	69%	64%	67%	....

Year	Aug.	Sept.	Oct.	Nov.	Dec.	Year Avg.
1935	67%	71%	77%	71%	61%	66%
1936	75%	78%	82%	80%	74%	72%
1937	74%	69%	65%	55%	45%	73%
1938	66%	66%	70%	65%	59%	61%

Week end. June 10, 1939—66%
Week end. June 17, 1939—67%
Week end. June 24, 1939—66%
Week end. July 1, 1939—70%
Week end. July 8, 1939—42%
Week end. July 15, 1939—71%

[1] Production-capacity ratios are based upon six-day capacity ratings which are adjusted periodically to correspond with the ratings reported by individual companies. Ratios are subject to revision until all reports are received.

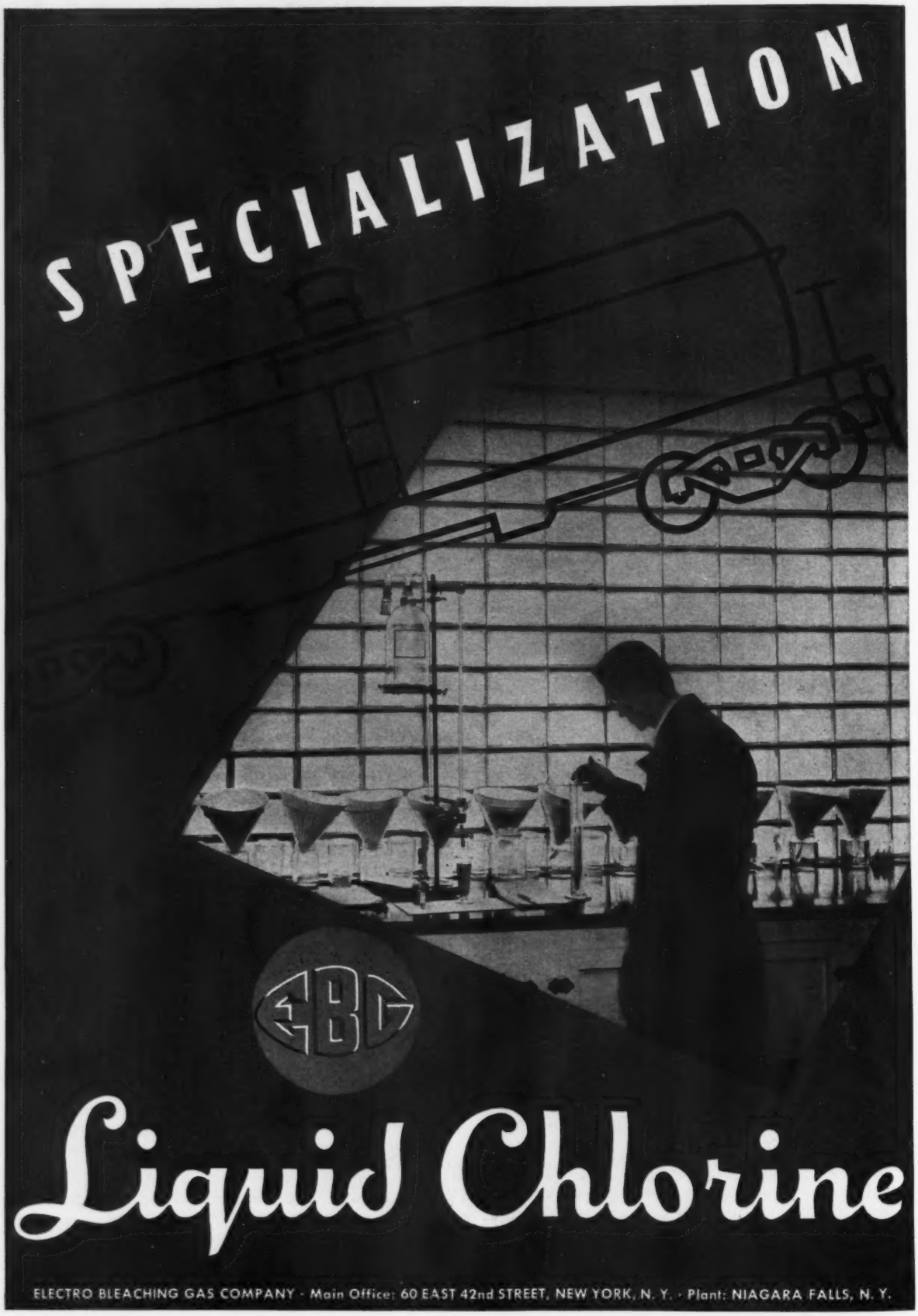
Pulp Sources Disappointing

WASHINGTON, D. C., July 24, 1939—Efforts in Japan to produce pulp from sources other than wood have been disappointing, according to a report from the Office of the American Commercial Attache at Tokyo to the Forest Products Division, Department of Commerce.

The principal difficulties encountered have been the lack of the necessary technical skill required to produce such materials, difficulty of access to adequate supplies of raw materials and considerably higher production costs than was originally anticipated.

Approximately 21 firms having a total authorized capitalization of 237,025,000 yen (approximately $64,637,000) had been organized for this purpose up to the end of March 1939. Only 8 of these firms have been successful in producing a finished product beyond the experimental stage, it is reported.

The action of the Japanese government in restricting imports of wood pulp has encouraged research to find a substitute pulp, according to the report.


SPECIALIZATION
EBG
Liquid Chlorine
ELECTRO BLEACHING GAS COMPANY - Main Office: 60 EAST 42nd STREET, NEW YORK, N. Y. - Plant: NIAGARA FALLS, N. Y.

Section of the
Technical Association of the Pulp and Paper Industry

Edited by Ronald G. Macdonald, Secretary

Review Of Paper Industry Literature

Copies of United States Patents can be obtained from the United States Patent Office, Washington, D. C. for 10 cents each. Send currency, not stamps.

Cellulose

Neutral Salt Solutions of Cellulose. H. Erbring and H. Geinitz. Kolloid-Z. 84, No. 1:25-42 (July, 1938); B. I. P. C. 9:9.—In calcium thiocyanate solutions of over 52 per cent concentration filter paper dissolves at 125 deg. C., while below this concentration swelling takes place. Extensive studies show that at higher temperatures there is a yellow coloration and decomposition of cellulose; at lower temperatures the viscosity rises with aging. Cellulose can be precipitated from such solutions by addition of alcohols, acetone, or water (least effective). The cuprammonium viscosities of the original cellulose and that precipitated from the calcium thiocyanate solution are practically identical. The sorption curve of calcium on the cellulose shows a maximum, indicating simultaneous solvent sorption. At very high temperatures calcium nitrate dissolves some cellulose but calcium chloride is not able to do so. Several other salts such as aluminum thiocyanate. aluminum chloride, zinc chloride, and sodium thiocyanate dissolve cellulose, while other salts do not. Most organic materials are inactive or lead to decomposition. Linters are only swollen in calcium thiocyanate.—C.J.W.

The micellar Structure and the Phenomena of Deformation in Fibrous Materials. V. O. Kratky. Kolloid-Z. 84, No. 2:149-168 (Aug., 1938); B. I. P. C. 9:58.—Theoretical relationships are proposed, on the basis of which the micellar network structure of cellulose fibers and films may be studied in the dynamic states of swelling, stretching, etc. Calculations are possible of the orientation of micelles before and during the application of such stresses.—C.J.W.

The Transformation of Hydrate Cellulose into Natural Cellulose. T. Kubo and K. Kanamaru. Z. physik. Chem. A 182; No. 5:341-360 (Sept., 1938); B. I. P. C. 9:97.—When hydrate cellulose is heated in liquids or gases at higher temperatures, the parallelism of the crystals increases. When polar liquids are used, the hydrate cellulose is changed to natural cellulose.—C. J. W.

The heterogeneity of Various Kinds of Cellulose. II. H. Lachs, J. Kronman and J. Wajs. Kolloid-Z. 84, No. 2:199-204 (Aug., 1938); B. I. P. C. 9:58-59. —The degree of degradation of cellulose fractions is estimated by a determination of the specific viscosity of the acetylated products. Four types of wood cellulose, ripened alkali cellulose, and finished rayon were thus examined. The ripening process is accompanied by a degradation (a decrease in viscosity is interpreted as an index of a decrease in moleculor weight) which is more marked in the samples whose original material was not degraded. The ripening process produces products of the same order of heterogeneity as that of the raw materials employed. This is also true of the final rayon produced, but the cellulose in the final product is about 40 per cent more degraded than is the ripe alkali cellulose.—C.J.W.

Highly Polymerized Compounds. 195. Cellulose xanthate solutions. Hermann Staudinger and Gunther Daumiller. Ber. 71, No. 9:1995-2002 (Sept. 7, 1938); B. I. P. C. 9:88.—Cellulose xanthates with one xanthate group per three glucose groups, and with one xanthate in each glucose group are prepared and their viscosities are measured. From these xanthates the cellulose is regenerated and its viscosity determined in Schweizer's solution. It is found that the colloid particles in dilute viscose solutions have the same macromolecular structure as the particles of the cellulose in Schweizer's reagent. The viscosity of the xanthates varies strongly with the degree of xanthation. Low xanthated celluloses have a higher viscosity than higher xanthated ones. In the ripening of xanthate solutions, xanthate groups are split off. This, and not an enlargement of the molecule, increases the viscosity.—C.J.W.

Polysaccharides. XXVII. The "end-group" method as applied to cellulose. F. J. Averill and S. Peat. J. Chem. Soc., Sept., 1938: 1244-1247.—"A study of the 'end group' method for determining the molecular size of polysacchrides shows that the accuracy claimed for it by Haworth and Machemer (Bull. Inst. Paper Chem. 3, No. 2:29 [October, 1932]) has not been over-estimated and that the criticisms of Hess and Neumann (Bull. Inst. Paper Chem. 7, No. 9:296, 297 [May, 1937]) are without foundation. On the other hand, it has been found impossible to substantiate the claims made by the latter authors for an alternative method of separating tetramethyl methylglucose from trimethyl methylglucoside which involves the conversion of the latter substance into an ether-insoluble barium phosphate derivative."—C.J.W.

Iodometric Determination of Oxycellulose. P. V. Moryganov and E. I. Vlasyuk. J. Applied Chem. (U.S.S.R.) 11:711-718 (1938); C. A. 32:6856.—The iodometric method was used to determine the degree of decomposition of cotton by bleaching. The material (4 grams) was refluxed with 100 cc. of one per cent sodium hydroxide for one hour, cooled, filtered and 32 cc. of the filtrate mixed with

10 cc. of 0.05*N* iodine in 50 cc. of water. After 20 minutes, the solution was acidified with 20 cc. of two per cent hydrochloric acid and unchanged iodine was back-titrated with 0.05*N* sodium thiosulphate. The results showed that hydrochlorite continually oxidized the cellulose of cotton, although at a decreasing rate. The above alkaline extract may also be used for the determination of the carboxyl groups, approximate results being obtained by a series of three titrations.—C.J.W.

Degree of Gelatinization of Cellulose and Wood. Edwin C. Jahn. Tech. Assoc. Papers 21:350-352 (June, 1938); Paper Trade J. 107, No. 9:38-40 (Sept. 1, 1938).—Data obtained to date are insufficient to prove or disprove the practicability of measuring the water retention property of a pulp; but they are sufficient to indicate that fundamentally the water retention factor is dependent upon the inherent properties of the pulp and might therefore be of practical value. The original moisture content of the sample has an effect on the water retained under pressure, particularly on the unbeaten and less beaten pulps, but not so large as might be expected. The amount of water retained by pulp in a mold press varies with the pressure applied and especially with the time of pressing; by prolonging pressing sufficiently, the values for water retained all tend to approach the same constant value. There seems to be a definite correlation between linear shrinkage of the pressed pulp and degree of gelatinization. Water retained by pulp mats under very mild suction for 30 sec. decreases with beating until the beating is fairly drastic, after which retention slowly increases.—A.P.-C.

Wood Cellulose. V. "Trimethylated" Cellulose from Thiriena Pulp. David J. Bell. Biochem. J. 32: 699-701 (1938).—Wood cellulose was methylated to a methoxy content of over 43 per cent and confirmed the findings of Barsha and Hibbert (*J. Am. Chem. Soc.* 58, 1006-1007 (1936)). The product showed a specific optical rotation in chloroform of 0 degs., whereas trimethylated cotton showed —10 deg. Over 90 per cent of the trimethylcellulose was transformed into simple glucosides by heating with 1 per cent hydrochloric acid in methanol at 80 deg. C. The only cleavage product identified was 2,3,6-trimethylglucose. Previous reports by Bell that a portion of wood celluloses was resistant to methylation apparently had their basis in mechanical rather than chemical circumstances.—A.P.-C.

Cellulose Research, 1933-1937. Louis Elsberg Wise. Paper Ind. 20:413-416, 540-543 (July, Aug., 1938).—A review with bibliography of 75 references. —A.P.-C.

Manufacture of Soluble Cellulose. Lancelot O. Rolleston, assignor to International Paper Company, U. S. Pat. 2,126,044 (Aug. 9, 1938).—Cellulose material (suitably sulphite or sulphate pulp) in the form of a loose bulky continuous sheet containing 0 to 18 per cent of water is fed through a 10 to 18 per cent sodium hydroxide solution at 35 degs. to 102 degs. C. (the exact conditions of time, concentration and temperature depending on the type of cellulosic material and use for which it is intended). Before and (or) after the treatment with sodium hydroxide, the cellulosic material is subjected to a similar, regulated treatment with carbon disulphide. In approximately 1 hr. the chemical reaction between the carbon disulphide and the pulp is complete; water or water containing sodium hydroxide is poured upon the treated material and the whole mixture is violently agitated in a suitable beater until the material is partly dissolved. Use of such pulp in admixture with ordinary pulp increases the dry strength, and especially the wet strength, of the paper produced therefrom. (Cl. 260-100.)—A.P.-C.

Lignin

Lignin. XVII. Decomposition of Spruce Lignin to Phenolcarboxylic Acids. Karl Freudenberg, Kurt Engler, Erich Flickinger, Alfred Sobek and Fritz Klink. Ber. 71, no. 9:1810-1820 (Sept. 7, 1938); B. I. P. C. 9:67.—Further experiments on the alkali fusion of lignin derivatives followed by methylation and oxidation give a higher yield of veratic, dehydrodiveratric, and isohemipinic acids. Cuproxam spruce lignin when distilled with 28 per cent sulphuric acid, gives 3.0 per cent formaldehyde. Willstätter lignin under the same conditions gives 2.5 per cent and when previously extracted by means of alkali and formic acid, 3.8 per cent formaldehyde.—C.J.W.

Lignin. XVIII. Beech Lignin. Karl Freudenberg and Hans Fr. Mueller. Ber. 71, no. 9:1821-1825 (Sept. 7, 1938); B. I. P. C. 9:67.—When beech lignin is fused with alkali, methylated and oxidized isohemipinic, veratic, and trimethylgallic acids are obtained.—C.J.W.

Relationship Between the Determinations of Pentosans and Lignin. Richard S. Hilpert and Heinz Meybier. Ber. 71, No. 9:1962-1965 (Sept. 7, 1938); B. I. P. C. 9:67.—An investigation of the residue of the pentosan determination of spruce, red beech, white beech, and straw shows an elementary composition similar to that of lignin. Hilpert sees in this another proof that lignin is a secondary reaction product.—C.J.W.

An X-ray Study of Lignin and its Significance for the Study of Living Matter. E. E. Harris, E. A. Parker, E. C. Sherrard, and G. L. Clark. Biodynamica No. 31. 12 p. 1937-1938. C. A. 32:3779.—"X-ray diffraction photographs of lignin in the following forms are presented: sulphuric acid lignin, methanol lignin, soluble lignins, methylated sulphuric acid lignin, methylated methanol lignin, oxidized lignin, nitrated lignin, and ligninsulfonic acid. Carbohydrate-free lignins from extractive free woods give patterns typical of the crystal lattice of organic substances of high molecular weight. Spacings in the lattice are changed by introduction of groups; oxidation causes little change. Most of the patterns indicate a particle size of 5×10^{-7} cm."—C.J.W.

Structure of Lignin. A. B. Cramer, M. J. Hunter and Harold Hibbert. J. Am. Chem. Soc. 60:2274 (Sept., 1938).—By organic solvent extraction there was obtained from a spruce wood about 1 to 2 per cent of an aromatic ketone which would seem to be one of several possible isomers, each consisting of a guaiacyl group with a side chain of three carbon atoms containing a carbonyl and a hydroxyl group. Such a structure would provide a satisfactory basis for interpreting the results obtained in the hydrogenation of methanol lignin at high temperatures and pressures. Work now in progress on oils from hard woods indicates the additional presence of derivatives containing the syringyl group, and it is possible that this may be the fundamental chemical difference between soft and hard woods.—A.P.-C.

The Structure of Lignin. Harold Hibbert. Can. J. Research 16B: 69-71 (1938).—The basic lignin-

building constituent is regarded as arising from the condensation of guaiacol with fructose or one of its derivatives, such as furfuryl alcohol; lignin is to be regarded as a condensation product of guaiacol with 4-ketohydroxypentanol. In hardwood lignin, the guaiacol is partly replaced by the syringyl radical.—A.P.-C.

Studies on Lignin and Related Compounds. XXIII. Isolation of Acetovanillone from Sulphite Waste Liquor. Irene K. Buckland. Geo. H. Tomlinson, 2nd, and Harold Hibbert. Can. J. Research 16B: 54-56 (1938).—Experimental details are given for the isolation and identification of acetovanillone from sulphite waste liquor. Autoclaving with sodium hydroxide 114 l. of waste liquor from commercial sulphite pulping of softwood followed by extraction with benzene yielded 297.5 g. of vanillin. Removal of the solvent left 178.5 g. of dark viscous oil which was separated by vacuum distillation into three fractions: (1) 9.7 g. boiling at 56 deg. to 86 deg. C. under 5.2 to 1.0 mm. of mercury, (2) 16.4 g. boiling at 140 deg. to 160 deg C. under 2 mm., and (3) residual tar. (1) was a mixture of phenols, (2) on redistillation gave as main fraction a crystalline solid boiling from 157 deg. to 180 deg. C. under 17 mm.; on recrystallizing from benzene, it gave acetovanillone, melting-point 114.5 deg. C., giving a semicarbazone that melted at 165.5 deg. to 166 deg. C. The preparation of acetovanillone through the Fries rearrangement of guaiacol acetate is described. Mixtures of synthetic and natural acetovanillone, and of the semicarbazones prepared from each, showed no depression of the melting-points. Acetovanillone gives no precipitate with *m*-nitrobenzoylhydrazine, and will therefore not interfere with the determination of vanillan by this method.—A.P.-C.

Mechanical Processes

Ground Wood from Pine. Kirmreuther. Wochbl. Papierfabr. 69, No. 27: 563-68 (July 2, 1938).—Greatest utilization of the wood is in the manufacture of white ground wood, then brown ground wood and then unbleached pulp. The author then discusses the value of the different kinds of coniferous and deciduous woods for ground wood with the aid of microphotographs showing the fiber lengths. The consumption of wood in Germany is graphically illustrated, about forty-three per cent being used for burning. In Germany 44 per cent of all the wood is pine, 25 per cent spruce, 13 per cent beech. Beech is unsuited for newsprint but cooked into pulp it is very satisfactory. In conclusion the author discusses the various methods for processing pine wood for the production of ground wood.—J.F.O.

The Sharpening of Pulp Stones. K. Meltzer and W. Muller. Wochbl. Papierfabr. 69, Special Number: 34-39 (June 17-19, 1938).—A device for regulating and recording the pressure of the stone sharpening burr is described with the aid of illustrations, showing the apparatus, the stone surface after correct burring and the position of the sharpener on the pulp grinder. A series of tests on the ground wood is run showing the physical properties and production.—J.F.O.

News Print from Pine Mechanical and Chemical Pulps. Grinding Experiments with a Coarse Grit Synthetic Stone. A. C. Fuller and Charles Carpenter. Paper Trade J. 107, No. 9: 30-32 (Sept. 1, 1938).—Young longleaf and loblolly pines ground on a coarse (30 grit) Aloxite stone yielded pulps of better paper-making qualities than had previously been made at the Savannah, Ga., laboratory from similar woods. Smooth and firm news print sheets that printed well were made from these groundwoods using either pine sulphate or sulphite pulps, and with or without the addition of filler and size.—A.P.-C.

Alkaline Processes

Production of Sudakov Halfstuff and its Use in Making Paper. I. E. Shcheglov. Tsentral. Nauch.-Issledovatel. Inst. Bumazh. Prom. Materialy 1937, No. 25:153-180; C. A. 32:8139.—A discussion of all the important phases of the production of Sudakov aspen halfstuff by macerating the chips in dilute sodium hydroxide at room temperature for about eight hours and beating the product in a rod mill based on the five-year experience of the Troitskii and Spartak mills and some laboratory experimental evidence. It is shown that Sudakov stuff alone or in mixture with 35, 60 and 90 per cent sulphite pulp can be used in making good grades of wrapping paper and paperboard. If tinted, it can be used for other kinds of paper, but not for writing and printing paper because of the brown discoloration. Certain improvements in the process of pulping and using Sudakov stuff in making papers are recommended.—C.J.W.

Production of Paperboard from Sudakov Halfstuff. N. N. Saprygina. Tsentral. Nauch.-Issledovatel. Inst. Bumazh. Prom. Materialy 1937, No. 25:181-190; C. A. 32:8139.—A bookbinding paperboard with superior mechanical properties resulted from 100 per cent Sudakov stuff beaten to 30-35 deg. freeness. With admixture of 25 per cent groundwood or paper waste a lower grade of board was obtained. Improvements in the pressing of paperboard to prevent blistering and separation into layers are suggested.—C.J.W.

Mastering the Use of Sudakov Halfstuff at Soviet Union Paper Mills. O. G. Ioffe. Tsentral. Nauch.-Issledovatel. Inst. Bumazh. Prom. Materialy 1937, No. 25:191-196; C. A. 32:8139.—A discussion.—C.J.W.

Chemistry of the Alkaline Wood Pulp Processes. V. Effect of Chemical Ratio at Constant Initial Concentration and the Effect of Initial Concentration on the Rate of Delignification and Hydrolysis of Douglas Fir by the Sulphate Process. Sidney L. Schwartz and Mark W. Bray. Paper Trade J. 107, No. 12: 24-32 (Sept. 22, 1938).—In small-scale sulphate pulping of Douglas fir, the rate of delignification was found to be accelerated by increasing the ratio of chemical to wood; the rate of decomposition of the cellulose was also increased, and the purity of the residues was not materially enhanced by going beyond a 30 per cent ratio. The effect of increasing the initial concentration varies with the specific chemical-wood ratio; at 15 per cent chemical the yield and purity of the pulp are but little influenced by concentration, at 30 per cent its effect is appreciable and at 60 per cent it is announced.—A.P.-C.

Recausticizing and Lime Recovery at Bogalusa. J. P. Rubush, Tech. Assoc. Papers 21: 267:268 (June, 1938); Paper Trade J. No. 4: 39-40 (July 28, 1938).—A description of the 350-ton continuous recausticizing and lime recovery system recently installed in the Bogalusa, La., sulphate mill of the Gaylord Container Corporation. Features of the equipment, arrangement and operation are briefly reported

and embody some departures from general practice. A new type of causticizing unit followed by one thickener and two filter stations in series result in advantageous flow and control features.—A.P.-C.

Sulphate Recovery Thermal Code. Paper Trade J. 107, No. 7: 35-37 (Aug. 18, 1938).—A tentative standard TAPPI code prepared to enable users to better evaluate the thermal factors involved in sulphate recovery, to detect undue losses from radiation and like causes, and more particularly to determine the thermal efficiency of the recovery unit.—A.P.-C.

Use of Starch in the Caustification of Green Liquor. A. V. Novikov. Nazhnaya. Prom. 15, No. 2: 55-57 (May, 1937); Chimie & Industrie 39: 953-954 (May, 1938).—Starch exerts a favorable influence on the coagulation of calcareous schlamms. Under its influence these schlamms form flakes that are permeable to the liquid but which cannot pass through the filter medium. The purity of the liquor is doubled. The coagulated schlamms, however, retain a small quantity of alkali.—A.P.-C.

Production of Fibrous Cellulose From Fiber-Bearing Plant Stalks. G. A. Lowry and J. A. Grant. Brit. pat. 484,089, (Oct. 28, 1936).—Scutched but unretted flax undergoes a preliminary hot-water digestion; the water is removed and the material is then digested in absence of air, oxidizing agents, acidic and soapy reagents, with 6 to 10 per cent of aqueous sodium hydroxide at 150 deg. to 180 deg. C. for 3 hrs. The material, which now comprises 25 per cent to 30 per cent of the original, is washed several times, at least one wash containing a reagent of a non-acid character which will remove iron. The resultant fiber finally receives a mild chlorine bleach.—A.P.-C.

Process and Apparatus for Extraction of Cellulosic Fibers from Highly Delignified Materials. Umberto Pomilio. Brit. pat. 480,252, (Feb. 15, 1938). —Cellulosic fibers are extracted from wood, bamboo and other highly lignified material by an alkali treatment followed by a chlorination treatment, the alkali reaction being conducted in a closed vessel at 100 deg. to 150 deg. C. and under 20 to 50 lbs. per sq. in. pressure, and the chlorine reaction in an open vessel at not exceeding 65 deg. C. The alkali employed is 2.4 per cent, 4.6 parts of solution being used for 1 of wood. After the chlorine treatment, the material is treated with alkali of 0.1 to 10 per cent concentration at up to 100 deg. C.—A.P.-C.

Process and Apparatus for Extracting Cellulose Fibers From Vegetable Material. Umberto Pomilio. Brit. pat. 480,170, (Feb. 15, 1938).—Cellulose fibers suitable for paper or cardboard are extracted from cereal stalks, flax, maize, hemp, sisal, bagasse, grasses, residues from the manufacture of textiles, etc., by treating the material with alkali, e.g., 1 to 2 per cent sodium hydroxide solution at 80 degs. to 100 degs. C., then treating with chlorine at not over 65 degs. C. and immersing in cold water immediately after the chlorination treatment. The reactions are controlled as to concentration of solution and time of treatment to ensure that the above temperatures are not exceeded and thus prevent damage to the fibers. Just sufficient alkali is used to react with the encrusting substances. After the chlorination, the material may be treated with 0.1 per cent to 10 per cent alkali solution at up to 100 degs., C.—A.P.-C.

Use of Electrolytic Chlorine for Manufacture of Cellulose. U. Pomilio. Trans. Electrochem. Soc. 73: 343-351 (1938).—The Pomilio pulping process is briefly described, and the history of its development, as well as that of the electrolytic chlorine cell, on which the process is based, are sketched. One of the great advantages of the process is held to be the close interlocking of the sodium hydroxide, chlorine and pulp industries.—A.P.-C.

Production of Cellulose. Angelo Contardi and Ciocca Baldo. Fr. pat. 823,525, (Jan. 21, 1938).—A light colored cellulose is obtained from corn stalks and the like by two successive treatments, first by very dilute solutions of alkali and alkaline-earth metal bisulphites and then by sodium hydroxide solution.—A.P.-C.

Recent Methods for the Processing of Deciduous Woods and Similar Plant Products of Cellulose. E. Wedekind. Wochbl. Papierfabr. 69, Special Number: 27-29, (June 17-19, 1938).—Due to the scarcity of spruce in Germany and to the fact that there are large quantities of red beech available; the processing of the latter has now run into large production. The red beech has the characteristic short fibers of the deciduous woods and in addition has a high pentosane content of 9 to 10 per cent. For most purposes, especially for artificial silk, this high pentosane content is no hindrance and for the manufacture of paper it serves as a cement to bind together the short fibers. The dioxan process, removes the lignin together with rosins, fats, etc. from the cellulose and does so without pressure and with considerably lower temperatures, about 90 degs. C. Using this process with red beech, a yield of 40.3 per cent of bleached stock with an alpha content of 87.8 per cent, lignin 0.3 per cent and pentosane 4.35 per cent.—J.F.O.

Question of Odor in the Manufacture of Sulphate Pulp. Torsten Jacobson, Wochbl. Papierfabr. 69, No. 38: 777-78; No. 39: 796-97, (Sept. 17, 24, 1938).—A compilation of abstracts taken from articles in the various paper and pulp periodicals and patents throughout the world on the above subject.—J.F.O.

Black Liquors

Rust-Preventive Paints Containing Tall Oil. H Schlenkert. Farbe und Lack 1938:365-366; B. C. A. 1938B:1191—Exposure tests indicate that esterified tall oil can be succesfully used; zinc oxide gave better protection as pigment than iron oxide. With blown and sulphurized oils embrittlement ensued. Drying and durability are improved by incorporating an alkyd resin.—C.J.W.

Conductrometric Control of Alkali Losses in Certain Waste Liquors of a Sulphate Mill. E. Venemark. Svensk Papperstidn. 41, no. 13:406-411 (1938); B. I. P. C. 9:61.—The methods for determining the total sodium oxide in waste water from the sulphate process are briefly reviewed. Reference is made to the possibility of using electric conductivity measurements for this purpose. The conductivities of sodium oxide in white liquor, black liquor, and sulphate soap at different concentrations in a natural water are given, from which it is demonstrated that the accuracy of an alkali determination by conductivity measurements depends upon the concentration and kind of liquor, as well as on the nature of the water, and especially on its conductivity and reactivity with the liquor. The method is of no value in water containing lime mud from the causticizing plant. Where local conditions are favorable, the control of alkali losses in waste water by conductivity recorders is recommended.—C.J.W.

Instrumentations Studies. XXX.

A Study of Instruments for the Measurement of Opacity of Paper

Part I: A General Discussion of Opacity and Methods For the Measurement of Opacity

By The Staff of The Institute of Paper Chemistry

Introduction

Like Part I of the report on "A Study of Photoelectric Instruments for the Measurement of Color: Reflectance and Transmittance,"[1] Part I of this report is a general discussion of the specific property under consideration (opacity) and of methods for evaluating that property. A discussion of opacity and of results of studies on instruments designed to measure opacity could logically have been made part of the scope of Instrumentation Studies XX. The measurement of opacity involves quantities used in the specification of color. Opacity, however, is a property of paper of great importance; and instruments which have been designed for the measurement of opacity alone are in use. For these reasons, opacity is made the subject of an instrumentation report apart from that on color. It is inevitable that a certain amount of overlapping shall occur between the present report and that on color. In order that such overlapping be minimized, reference will occasionally be made to Instrumentation Studies XX, a copy of which should therefore be at hand. The results of studies of individual instruments will be presented in succeeding parts of this report.

Opacity, Translucency, and Transparency

A study of the literature on opacity reveals that much of the confusion in the measurement and expression of this property is attributable to the absence of coordination between instrument makers, the users of the instruments, and the published scientific work on the evaluation of opacity. Considerable confusion exists over terminology alone. Quite often the three terms, "opacity," "translucency," and "transparency" are used indiscriminately. Twenty-five years ago Sammett[2] pointed out the differences in meanings of these three terms. A body may be said to be opaque when it is impervious to light; it is translucent if it admits the passage of light, but scatters light so strongly that objects cannot be distinctly seen through it; it is transparent if it permits the passage of light, but scatters the light to such a small extent that objects can be distinctly seen through it. When a parallel beam of light is incident upon a sheet of paper, a certain fraction of the light is transmitted; the sheet is more transparent when a greater fraction of the transmitted light emerges from the sheet within any given small angular range with respect to the direction of the incident beam[3, 4]; the sheet is more translucent when the transmittance is higher, the spatial distribution of the transmitted light being more or less independent of the direction of the incident beam. It might be argued that a sheet of translucent paper is transparent because letters on a printed page placed immediately below the sheet can be seen and recognized. Simple geometrical reasoning[4] shows, however, that the printed matter may be recognized through the translucent sheet because the linear dimensions of the type faces are of the same order of magnitude as the thickness of the sheet; when the distance between the printed sheet and the translucent sheet is made substantially larger than the width of a type face, the printed matter cannot be read. A sheet of book or bond paper is translucent. Transparent or glassine papers are not strictly transparent, but are relatively transparent, and it is more meaningful to measure and discuss the transparencies of such papers than it is to treat them as being translucent. Fig. 1 illus-

[1] Instrumentation Studies. XX. *Paper Trade J.* 105, no. 18:135-141; no. 19:27-39 (Oct. 28, Nov. 4, 1937).

[2] Sammett, C. F. Measurement of the transparency of papers, U. S. Dept. Agr., Bur. Chemistry, Circ. No. 96, 1912. Also in: *Paper Trade J.* 54, no. 17:56 (April 25, 1912); *Paper* 7, no. 7:22-23 (May 1, 1912); *Papier-Fabr.* 10, no. 19:540-541 (May 10, 1912); *Papier-Ztg.* 37, no. 75:2687-2688 (Sept. 19, 1912); *Chem. News* 105:290-292 (1912); *World's Paper Trade Rev.* 57, no. 19:941-942 (May 10, 1912); *Paper Mill* 35, no. 17:34-35 (April 27, 1912); *Paper Making* 31, no. 6:212, 214 (June, 1912); *Paper Makers' Mo. J.* 50, no. 5:163-164 (May, 1912).

[3] Instrumentation Studies. XVII. *Paper Trade J.* 105, no. 2:41-48 (July 8, 1937); no. 3:35-44 (July 15, 1937).

[4] Wicker, D. B. The fundamentals of glassine transparency. Part I. *Paper Trade J.* 105, no. 17:31-40 (Oct. 21, 1937).

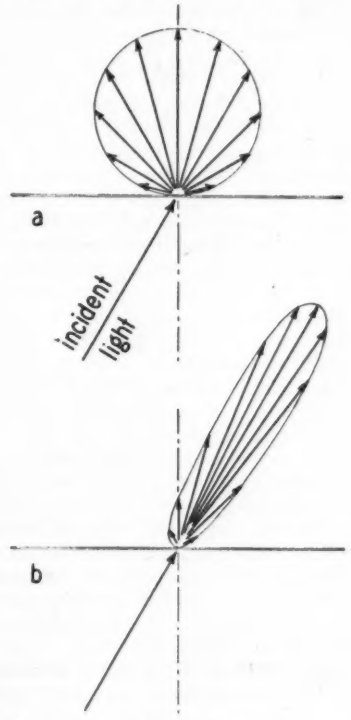


FIG. 1.

trates the essential difference between translucent and transparent papers.

A translucent sheet (Fig. 1, *a*) scatters light so strongly that the spatial distribution of transmitted light is nearly symmetrical about the normal direction. A transparent sheet (Fig. 1, *b*) scatters light to such a small extent that most of the energy of transmitted light is distributed in a small range of angles with the direction of the incident beam.

If "opaque" means "impervious to light," it might seem logical to evaluate the opacity of paper by measuring its transmittance (fraction of incident light transmitted). The measurement of transmittance would be pertinent if it happened that, in typical use, paper were employed to block the passage of light or were used, like a pane of frosted glass, to transmit and diffuse light. Indeed, where paper is used to protect packaged materials from light, opacity should be determined by measurement of transmittance; here, incidentally, it is meaningless to measure the transmittance to "white" light, because photochemical reactions depend critically upon the wavelength of light — the transmittance must be measured as a function of wavelength in both the ultraviolet and visible regions. In typical uses of paper, however, the opacity of a sheet is judged by looking at the sheet by reflected light, not by viewing it in transmitted light[2]. The sheet is placed over a surface having light and dark areas, and the brightness values of those areas of the sheet lying over the light and dark areas are compared; by such comparison of brightness values judged in *reflected* light is the opacity of paper typically observed. Unfortunately, there is no simple relationship between opacity of paper as determined by this method and transmittance. Quite naturally, high opacity is associated with low transmittance and, *vice versa,* low opacity is associated with high transmittance; but two sheets having the same transmittance may have noticeably different opacity.

Contrast Ratio

Priest[5] attributed the fundamental principle of the currently accepted method of evaluating opacity to Sammett[2], who compared the reflectance of a sheet when backed with a black surface with that of the sheet when backed with a white surface. During the year following Sammett's first publication on this subject, Tillyer and Keuffel of the Bureau of Standards, and independently Priest and his co-workers, also of the Bureau of Standards, developed apparatus utilizing the Martens photometer. The measurement of reflectance was refined, and the concept of "contrast ratio" was introduced. At about the same time (1913), according to Priest, Nutting, of the Eastman Kodak Co., was independently using a contrast method for the evaluation of opacity. The design of the present Bureau of Standards or the well-known "Aminco" opacity meter is based on that of Priest's instrument.

If the reader is not familiar with the term "contrast ratio," he may acquire its basic meaning by considering the following experiment. Imagine the test sample to be uniformly and diffusely illuminated with white light. A black cavity is placed behind a portion of the sample, and a white body is placed under an area near that covering the black cavity. The sample is then viewed in a direction perpendicular to the surface of the sample. If the sample is not perfectly opaque, that portion which lies over the black cavity will appear darker than that which lies over the white body. By means of a suitable photometric device (*e.g.,* a Martens photometer) the ratio of the brightness[6] of the portion over the black cavity to that of the portion over the white body is determined. This ratio is contrast ratio.

An instrumentally determined value of contrast ratio is subject to errors of three principal types: (*a*) spectral, (*b*) geometrical, and (*c*) photometrical. The reader interested in a detailed account of the origin of spectral, geometrical, and photometrical errors will appreciate that errors enter into the determination of contrast ratio just as they do in the determination of reflectance. To avoid needless repetition, the reader is referred to the appropriate sections of Part I of Instrumentation Studies XX for discussion of the errors which enter into a determination of reflectance.

An outstanding source of error in the determination of contrast ratio is peculiar to the method of measurement and does not exist in color measurement. It is mainly of a geometrical nature, and is associated with the "effective reflectance" of the white body over which the test sample is placed. Since magnesium oxide does not conveniently serve as the white body, magnesium carbonate has generally been employed; but the surface of a block of magnesium carbonate is easily damaged by contact; hence, the test sample is usually spaced away from the surface of the magnesium carbonate by a small distance. Apparently the influence of this spacing on measured values of contrast ratio was not thoroughly understood until 1934, when Judd[7] published a theory of this geometrical effect. This theory is almost purely geometrical, for it assumes idealized sheets having reflectance but no capacity to absorb light; however, experimental data show that the theory holds with good accuracy for white papers[7]. In a later paper, Judd[8] shows how the effective reflectance of the white body (in the Bureau of Standards opacity meter) depends upon the spacing and the reflectance of the material of the white body. The design of the Bureau of Standards instrument is such that the spacing between the surface of the white body and an opal glass standard is appreciably less than that between a paper sample and the white body. When an opal glass standard is in place, the effective absolute reflectance of the white body is about 0.92, while it is 0.89 for a typical white paper[9]. Thus, in the Bureau of Standards opacity meter, the effective reflectance of the white body depends to some extent upon thickness of the test sample. The values for the effective reflectance of the white body are rather low because inferior magnesium carbonate has been employed[10].

An actual instrumental value of contrast ratio, *C*, depends upon the effective reflectance of the white body. If, to use Judd's notation, the effective re-

[5] Priest, I. G. The Bureau of Standards contrast method for measuring transparency. *Trans. Am. Ceram. Soc.* 17:150-155 (1915).

[6] Report No. 17, Part I, to the American Paper and Pulp Association; Instrumentation Studies. XX. *Paper Trade J.* 105, no. 18:135-141 (Oct. 28, 1937); no 19:27-39 (Nov. 4, 1937). In the present report, "brightness" should be taken to mean "visual efficiency."

[7] Judd, D. B. Sources of error in measuring opacity of paper by the contrast-ratio method. *Bur. Standards J. Research* 12, no. 3:345-351 (March, 1934).

[8] Judd, D. B. Opacity standards. *Bur. Standards J. Research* 13, no. 3:281-291 (Sept., 1934); *Paper Trade J.* 100, no. 1:28-32 (Jan. 3, 1935).

[9] These reflectances are *absolute* reflectances. In TAPPI Standard T 425 m-35, the specified *apparent* reflectance, 91.5 per cent, for the white backing (to be placed in *contact* with the sample), is the absolute effective reflectance of the white cavity, 0.89, divided by the absolute reflectivity of magnesium oxide, which latter is taken to be 0.97.

flectance of the white body is R', the corresponding contrast ratio is designated $C_{R'}$. In the measurement of contrast ratio of various materials, several effective reflectances have been used, and, corresponding to each effective reflectance, there is a contrast ratio $C_{R'}$. The absolute value of R' is 0.89 when the "TAPPI opacity" of paper is measured; that is, TAPPI opacity is $C_{.89}$. The situation is obviously an unsatisfactory one, but, thanks to the theory of Kubelka and Munk, [11, 12] it is possible to relate any $C_{R'}$ with the more fundamental qualities, R_0 (reflectance of a single sheet over a black cavity), and R_∞ (reflectivity of the paper, i.e., the reflectance of a pad of the paper sufficiently thick to be opaque), and also with any other contrast ratio corresponding to a different effective reflectance of the white body [13, 14]. The Kubelka and Munk theory, it should be stated, holds rigorously only for homogeneous sheets.

One of the shortcomings of the Bureau of Standards method or of any other method using a polarization photometer has been pointed out by J. d'A. Clark,[15] according to whom only 2.3 deg. of the angular scale corresponds on the important range in contrast ratio, 0.85 to 1.0. With the ordinary angular scale it is therefore impossible to obtain precise values of contrast ratio in the range, 0.9 to 1.0. The method suffers the further errors common to all methods employing visual photometry. The mean deviation of individual readings is of the order of 0.7 per cent, and the means of sets of ten observations will deviate from each other by the same order; even under the best conditions of observation the means may occasionally differ by as much as 1.5 per cent[16]. Visual methods have the further disadvantages of being time-consuming and tedious when good accuracy is required. Hence, the development of photoelectric instruments is a matter of some importance. One such instrument, well-known to the paper industry, has been developed by Davis[17] and is manufactured by the Bausch and Lomb Optical Company. Properly designed spectrophotometers and reflection meters, made primarily for the measurement of spectral reflectance, should also serve to measure opacity; however, the rather complex structure[8] that has been set up for the correction of opacity meter readings to arrive at TAPPI opacity has been developed mainly with regard to the Bureau of Standards instrument. While methods of adjustment and correction charts have been devised for the Bausch and Lomb opacimeter,[18] and may be devised for other photoelectric instruments, there exists no general correction scheme or procedure for photoelectric opacity meters, spectrophotometers and reflection meters.

The difficulty in arriving at TAPPI opacity by means of any given photoelectric instrument may be explained briefly with the help of Fig. 2. The test

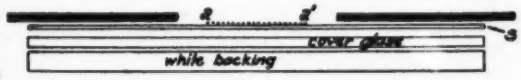


FIG. 2.

sample, s, is illuminated over an area a-a', and is separated from the white background by an air space and possibly also a thin glass plate. It will be seen that the area of the white surface illuminated (by transmitted light) would be larger than the illuminated area of the sample. Some of the diffuse light incident upon the area a-a' of the test sample, s, is reflected, some is absorbed, and the remainder is transmitted and multiply reflected (in complex fashion) between the white backing and the sample. After each reflection from the white surface, some of the light is transmitted by the sample, and contributes to the reflectance over white, $R_{R'}$. During each transit across the space separating the sample and white surface, some light is lost in absorption in the glass plate, and some is lost by direct propagation out of the separating space. Hence, the effective reflectance will depend upon the area of sample illuminated, the distribution of intensity of incident light over the area, the thickness of the air space, the thickness and index of refraction of the glass, the absorption coefficient of the glass, and the absolute reflectance to diffuse light of the white surface itself. According to TAPPI Standard T425 m-35, "The standard white backing shall have an apparent reflectance equal to 91.5 per cent. It shall consist of a permanent diffusing surface of this apparent reflectance in contact with the sample, or of an equivalent cavity, such as that provided by a diffusing surface separated from the sample by a cover glass." An apparent reflectance of 91.5 per cent corresponds very nearly to an absolute reflectance of 0.89. The apparent reflectance of the white backing has been determined by visual photometry using light from incandescent lamps. It is necessary to take these facts carefully into consideration when a proper white backing having "apparent reflectance equal to 91.5 per cent," or "an equivalent cavity," is made. If a permanent diffusing surface is to be spaced away from the sample, the reflectance of the surface must be just sufficiently higher than 91.5 per cent to give the effective reflectance of the cavity the proper value. This "cut-and-try" process is a bothersome one and is subject to appreciable errors. It is important that the effective reflectance of the cavity be arrived at by computation[8] (using the Kubelka and Munk theory) or by the use of the chart prepared by the Colorimetry Section of the Bureau of Standards[13]. Erroneous results may be expected if the effective reflectance of the cavity is measured directly by exposing the naked cavity to the incident light; this fact may be understood by consideration of the nature of

[10] Judd states in a footnote to RP660 (ref. 7) that commercial magnesium carbonate is "yellow," and suffers reduction in reflectance when exposed to strong light. Relative to magnesium oxide, the reflectance of the magnesium carbonate used by him was found to be 0.91. At The Institute of Paper Chemistry, properly surfaced blocks of magnesium carbonate of good grade have repeatedly been compared on a recording spectrophotometer with magnesium oxide, and it is almost invariably found that the spectral reflectance curves differ by less than 0.5 per cent; this order of difference occurs only in the blue and violet, where the reflectance of magnesium oxide is the higher.

[11] Kubelka, P., and Munk, F. Ein Beitrag zur Optik der Farbanstriche. Tech. Phys. 12:593-601 (1931).

[12] Steele, F. A. The optical characteristics of paper. I. The mathematical relationships between basis weight, reflectance, contrast ratio and other optical properties. *Paper Trade J.* 100, no. 12:37-42 (March 21, 1935); *Tech Assoc. Papers* 18:299-304 (June, 1934).

[13] Judd, D. B. Dependence of reflectance and opacity on thickness; relation between contrast ratio and printing opacity. *Tech. Assoc. Papers* 18:441-442 (June, 1935); *Paper Trade J.* 101, no. 5:40-41 (Aug. 1, 1935).

[14] Judd, D. B., *et al.* Optical specification of light-scattering materials. *Bur. Standards J. Research* 19, no. 3:287-317 (Sept., 1937). This paper is a thorough account of recent work carried out at the Bureau of Standards on opacity of paper and other materials; general considerations, working formulas and charts are given.

[15] Clark, J. d'A. The measurement of the contrast ratio of opaque and translucent papers. *World's Paper Trade Rev.* 92, no. 12:996, 998, 1000, 1002, 1004 (Sept. 20, 1929); *Paper Trade J.* 89, no. 20:62-64 (Nov. 14, 1929); *Pulp Paper Mag. Canada* 28, no. 22:835-836, 858 (Nov. 28, 1929).

[16] U. S. Bureau of Standards. Transparency of paper and tracing cloth. Circular no. 63, 1917.

[17] Davis, M. N. Simple and reliable photoelectric opacity tester. *Paper Trade J.* 96, no. 19:38-40 (May 11, 1933); *Tech. Assoc. Papers* 16:277-279 (June, 1933).

[18] The Bausch and Lomb Optical Company, Rochester, N. Y. Bulletin D-236.

multiple reflections occurring between the test sample and the cavity, and the effect of these multiple reflections on the apparent reflectance of the sample when backed by the white body.

The effective reflectance of the white cavity is dependent to some extent on the optical properties of the *test sample*. For ordinary white papers the effective reflectance is nearly constant from sample to sample. In the case of the more transparent papers (*e.g.*, glassines), however, the effective reflectance of the cavity depends markedly upon the properties of the sample. The nature of this dependence is determined by the design of the instrument.

Even when the permanent diffusing surface is used in contact with the test sample, its reflectance should be obtained by calculation, or by the use of the opacity chart. The most popular working standards of reflectance are made of pot opal glass. In these standards light is scattered through appreciable distances, and this effect causes the apparent reflectance of such standards to be dependent upon the area illuminated;[19] in addition to this, the paper sample over the white surface alters the distribution of light incident upon the white surface, generally in such a way as to make incompletely diffused light more diffuse.

Care must be taken in selecting a white backing material having nearly the same spectral reflectance as that of the magnesium carbonate involved in TAPPI opacity. The photoelectric instrument must measure reflectances for light "which is in effect completely diffused." It is generally presumed that the reciprocal geometry of illuminating and viewing, in which the sample is illuminated normally and all reflected light is measured, is equivalent to that specified in TAPPI Standard T 425 m-35. The photoelectric instrument must further satisfy the requirement that reflectance values be free of spectral and photometrical errors[6].

In the absence of a suitable white backing surface, a good approximation to TAPPI opacity may be obtained on a spectrophotometer or "abridged spectrophotometer" by the following procedure. The spectral reflectance curve for a single sheet backed by a black cavity (to give R_0) and the spectral reflectance curve of a "pad" of the paper sufficiently thick to be opaque (to give R_∞) are obtained. From these curves the corresponding I.C.I. visual efficiencies for I.C.I. illuminant A[20] are obtained as previously described[6]; after conversion to absolute values, these visual efficiencies will be very nearly the R_0, R_∞, and values appearing on the Bureau of Standards chart[18] showing the interrelation between R_0, $R\infty$, and TAPPI opacity, $C_{.89}$. The TAPPI opacity may then be obtained from the chart, *provided that the paper is optically homogeneous* or sufficiently homogeneous for the Kubelka and Munk theory to be applicable. In the case of coated sheets, the use of the chart may lead to appreciable error; hence, this method should be very carefully tested before it is employed to evaluate TAPPI opacity of coated or other optically nonhomogeneous papers. As a general rule, however, the theory holds with very good accuracy; it appears to be valid for sheets containing filler, in spite of the fact that the distribution of filler through a sheet is not uniform. In the case of some white papers it will be found possible to eliminate the calculation of visual efficiencies by taking R_0 and R_∞ directly from the spectral reflectance curves at wavelength 572 millimicrons (the centroid wavelength of the visibility function multiplied by the relative spectral energy distribution of I.C.I. illuminant A).

Printing Opacity

The bothersome source of error discussed in the preceding section is entirely absent in the determination of printing opacity. This measure of opacity is defined as the ratio of the reflectance of a single sheet backed by a black cavity to that of the sheet when backed by a sufficient number of sheets of the same paper to form an essentially opaque pad. In the nomenclature of the preceding section, printing opacity is the ratio, R_0/R_∞. Of all the quantities that are determined from reflectance measurements, *printing opacity is probably least subject to instrumental error.* If the measuring instrument gives accurate reflectance values, it is not necessary to apply time-consuming or tedious corrections to the instrumental values to arrive at printing opacity.

Davis[21, 17] has pointed out that printing opacity measures most directly and most correctly the opacity visually judged by the "show-through" observed in the top sheet of a pile of similar sheets bearing printed or written matter. In view of this important consideration, and the fact that the theoretically important quantities R_0 and R_∞ determine printing opacity, this measure of opacity is fundamental from both practical and scientific points of view. Where one may logically expect good correlation between subjective estimates of opacity of book papers and printing opacity, inversions of ranking may occasionally be expected when instrumental opacity is expressed as TAPPI opacity, although the correlation between printing opacity and TAPPI opacity is usually good[21].

There appear to be three arguments in favor of TAPPI opacity as a *general* measure of opacity. First, very small samples of paper are sometimes submitted; the submitted sheet area would probably be sufficient for a measurement of TAPPI opacity, but possibly insufficient for the tab of several thicknesses required for the measurement of R_∞. Second, the reflectivity of paper is generally less than 91.5 per cent; hence, numerical values of printing opacity are generally greater than the corresponding values of TAPPI opacity; for a given range of opacity, then, the spread of printing opacity values will be smaller than that of TAPPI opacity. Third, whereas TAPPI opacity is a measure of contrast (in brightness) by "show-through" for a single sheet placed over a background having nearly maximum contrast (black to 91.5 per cent brightness), the corresponding contrast in background which obtains in the determination of printing opacity is that between black and the brightness of a pile or tab of the paper; thus it might be argued that, where paper is used to cover (and hide) any given background, TAPPI opacity would be the better measure of opacity. These three contentions should be examined carefully.

The practice of submitting small samples for test has long been decried, for adequate tests cannot be performed on a small piece of paper. As a general rule, sufficient area is presented for several measure-

[19] Instrumentation Studies XIII. Part II. *Paper Trade J.* 104, no. 19:51-63 (May 13, 1937).

[20] TAPPI Standard T 425 m-35 specifies that the color temperature of incident light be between 2400° and 2800° K. I.C.I. illuminant A has a color temperature of 2848° K. I.C.I. illuminant C would possibly be a better standard illuminant for the standard specification of opacity.

[21] Davis, M. N. Methods and instruments for opacity measurement. *Paper Trade J.* 93, no. 16:39-42 (Oct. 15, 1931); *Tech. Assoc. Papers* 15:347-350 (June, 1932).

ments of printing opacity. In the event that a small sample is submitted and larger samples cannot be obtained, it would, in most cases, be possible to obtain printing opacity from the Bureau of Standards opacity chart through measurement of R_0 and $C_{.89}$. The first listed reason for preferring TAPPI opacity should therefore be dismissed as being of no importance.

It is very difficult to grade various papers of different brightness with respect to opacity by simple visual (completely subjective) means, because the estimation involves comparing the difference in brightness of one pair of fields with that of another pair of fields. It is difficult, therefore, to estimate how much instrumentally determined opacities must differ before a perceptible difference is noted. There is, however, a particular situation of practical importance in which good subjective discrimination obtains. This is pictured in Fig. 3, in which two sheets of paper, *A* and *B*, having the same reflectivity R_∞ but different opacity, are laid side by side over a background consisting of a black portion, *b*, and a portion, *p*, consisting of a pile of paper *A* or *B*. The areas (1) and (2) will match in brightness, while the darker areas (3) and (4) may or may not appear to match. A good photometrical field exists for the latter comparison, hence a difference of 1 to 1.5 per cent between the R_0 values would be perceptible. This means that, under the *best* conditions of observation, a difference of 1 to 1.5 per cent of the printing opacity would be perceptible. Similar reasoning leads to the conclusion that a least perceptible difference in TAPPI opacity is also of the order of 1 to 1.5 per cent. Since the precision of a photoelectric instrument can be considerably better than 1 per cent, the second reason for preferring TAPPI opacity to printing opacity can be regarded as being of no real importance.

The third and most important argument favoring TAPPI opacity as a *general* measure of opacity must be considered in the light of use requirements. In use, a single sheet of paper may cover any type of background, hence it is proper to use TAPPI opacity, the measurement of which involves nearly maximum possible contrast of brightness in the background. For the range of ordinary white papers, however, inversions in the correlation between printing opacity and TAPPI opacity are not serious from a practical standpoint. The worst inversions would be observed in comparisons of opacities of white and gray papers. If two sheets, one white, the other gray, had the same printing opacity, it would be found that the white sheet had the greater TAPPI opacity. As an illustration we may take a sheet, *a*, for which $R_0 = 70$ and $R_\infty = 80$ per cent, and a sheet, *b*, for which $R_0 = 55$ and $R_\infty = 62.9$ per cent; the two sheets have the same printing opacity, 0.875. By use of the opacity chart it is found that the TAPPI opacities are, sheet *a*, 0.842, sheet *b*, 0.790, or a difference of 0.052. In view of the previously mentioned difficulty in the subjective comparison of opacities of papers having different brightness, this difference would probably not be of importance. One must, however, take notice of the fact that, in typical use requirement, the opacities of *similar* papers are compared. In view of this, an exhibition of papers having greatly different brightness and sensibly similar printing opacity, but appreciably different TAPPI opacity, would not be of practical importance. When opacities are compared in practice, it is generally the rule for the papers to be in the same or in closely similar grades, and to have brightness values falling in a rather narrow range. When reflectivities do not differ greatly, one may use printing opacity for reliable comparison of papers where a general type of opacity is involved.

We have discussed printing opacity in some detail because the desirable features of this quantity have not received adequate attention in the published literature. It is suggested that serious consideration be given to the possibility of attaching more importance to this quantity in the specification of opacity.

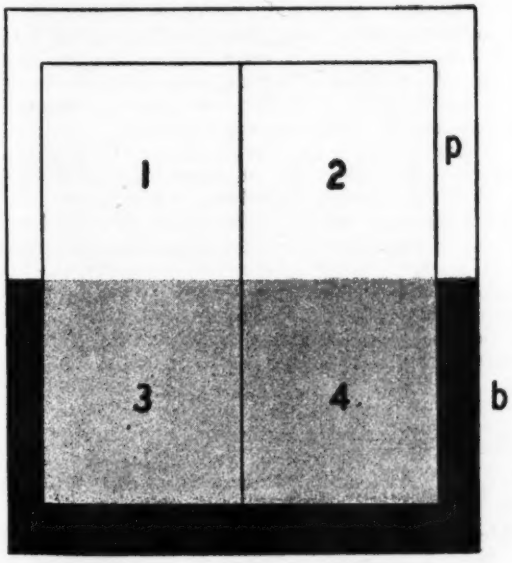


FIG. 3.

Transmittance

If properly measured, transmittance may be regarded as a fundamental optical property of a sheet of paper. As we have seen, however, transmittance alone cannot be expected to serve as an accurate measure of the kind of opacity typically judged in practice. According to some writers, however, transmittance should be taken as a measure of opacity because it can be measured with precision, and because it is fundamental. At the present time, adequate precision can be obtained in the measurement of contrast ratio and printing opacity. Quantities fundamental to the most successful theory[11] of absorption and scattering of light in paper and other light absorbing and diffusing media are R_0, R_∞, and other reflectances like $R_{.97}$; this theory does not require a knowledge of transmittance, although it provides for the computation of transmittance.

The claim for accuracy in transmittance measurements should be carefully examined. In the usual methods of measurement, the sample is placed between an incandescent lamp and a photocell, with the photocell in close proximity to the sample. The incident light is not diffuse, but meets the surface in a range of angles with the normal. Not all of the transmitted light falls upon the active surface of the photocell, and that light which does impinge upon this surface meets the latter in a large range of angles. The response of a photocell depends upon the angle of incidence of light on the active surface.

Part of the light transmitted by the sample is multiply reflected between the photocell and sample. Hence, while the measurement of transmittance may be precise in the sense that readings may be reproduced with precision, the apparent transmittance values are functions of *(a)* spectral energy distribution of the light, *(b)* spectral transmission of the sample, *(c)* spectral reflectance of the sample, *(d)* spectral reflectance of the photocell, *(e)* spectral response of the photocell, *(f)* geometry of illumination, *(g)* geometry of "viewing," and *(h)* such characteristics of the surface of the photocell as dependence of response upon angle of incident light, a real uniformity of response, etc. Thus, as usually measured, transmittance is not *fundamental,* and the accuracy of the measurement is poor.

Chief among the conditions to be met by a method giving values of transmittance useful in theories are: *(a)* the incident light must be monochromatic, *(b)* the incident light should be completely diffused, as is the light issuing from a small opening in a large and properly designed integrating sphere, *(c)* all of the transmitted light must be gathered by a properly designed integrating sphere by way of a small opening in contact with the sample, and *(d)* the photometrical method employed to measure intensity of light in the integrating sphere must be free of appreciable error. The transmittance to diffuse light must then be arrived at by a calculation involving various corrections.

For certain purposes of mill control, the simple method for measuring transmittance, involving only lamp, sample, and light-measuring means, has proved very useful; but the transmittance measurement has little fundamental meaning.

New TAPPI Members

The election to membership in the Technical Association of the Pulp and Paper Industry by the Executive Committee of the following is announced by Secretary R. G. Macdonald:

Elmer K. Stilbert, Jr., is a graduate of the New York State College of Forestry.

John S. Ware, engineer, National Sugar Refining Company, Inc., New York, N. Y., is a graduate mechanical engineer of Columbia University. He was formerly with Westinghouse Electric and Manufacturing Co., R. W. Cramer & Co. and American Molasses Company.

Ernest G. Rolph, managing director, Canada Glazed Papers Ltd., Toronto, Ontario, is a graduate of the University of Toronto. He was formerly with the Howard Smith Paper Mills and the Alliance Paper Mills.

David Russell, managing director, Messrs. Tullis, Russell and Co. Limited, Rothes, Markinch, Fife, Scotland, is a graduate of the University of Edinburgh and received an Honorary LL.D. from St. Andrews.

Richard P. Aument, head of laboratory, American Box Board Company, Grand Rapids, Michigan, is a graduate of Colgate University. He has been with the American Box Board Company for 13 years.

C. Emil Creutz, vice-president and general manager, American Heat Reclaiming Corporation, New York, N. Y., is a graduate of Chalmers Institute of Technology. He was formerly with Lindholmen, Gothenburg; Royal Navy, Karlskrona; De Leval, Stockholm; Ljungstrom, Finspong, all of Sweden; and with Babcock & Wilcox Company, and Air Preheater Corporation.

Robert C. McKee, chief chemist, Ogden Division, Container Corporation of America, Chicago, Ill., is a graduate of Grinnell College and received his M.S. degree from the Institute of Paper Chemistry.

N. M. Brisbois, vice-president in charge of operations, Fibreboard Products, Inc., San Francisco, Cal., has been with this company for 12 years. He was formerly with National Paper Products, Sutherland Paper Company, Kalamazoo Vegetable Parchment Company and the Pusey & Jones Company. His training was in engineering.

Robert W. McCormick, salesman, Knowlton Brothers, Watertown, N. Y., is a graduate of the United States Naval Academy and has been with this company for 13 years.

Frederick J. Myers, research chemist. Resinous Products and Chemical Company, Inc., Philadelphia, Pa., is a graduate of Queens University and received an M.S. degree from the same and a Ph.D. degree from New York University.

Carl A. Ireton, chemical engineer, Specialty Papers Company, Dayton, Ohio, is a graduate of the University of Cincinnati. He was formerly with the Standard Printing Ink Company.

Douglas R. Best, Beaterman, Missisquoi Corporation, Sheldon Springs, Vermont, is a graduate of the University of Maine.

Uses and Applications of Chemicals

The Reinhold Publishing Company has recently published "Uses and Applications of Chemicals and Related Materials". This is a 665 page guide to the current industrial uses; potential applications and sales possibilities of 5167 products, compiled and edited by Thomas C. Gregory and is founded on data published over several years in the *Oil, Paint and Drug Reporter.*

It is of particular value to sales executives, research directors, manufacturers, dealers, and all others interested in the use of chemical products. Included are inorganic and organic chemicals, mineral acids, organic acids, fine chemicals, drugs, metals, petroleum products, ores, minerals, animal and vegetable oils, essentials oils, waxes, etc. There are many new products described which many should find valuable for improving products or solving difficulties encountered in processing operations.

Carnauba wax offers an illustration of how each material is discussed. In the paper industry this material is used as an ingredient in the manufacture of compositions for the stiffening of cardboard containers; compositions for carbon paper; and compositions for making colored waxed papers.

Copies may be obtained at ten dollars per copy from the Book Department of the Technical Association of the Pulp and Paper Industry, 122 East 42nd street, New York, N. Y.

Mills & McNally Incorporate

[FROM OUR REGULAR CORRESPONDENT]

LAWRENCE, Mass., July 24, 1939—Mills & McNally Corp. has been incorporated with a capital of $25,000, to deal in paper and pulp. Incorporators are Melin A. Mills, Lawrence; Margaret A. Bowdell, Danvers, and Grace B. Inman, Boston.

Imports of Paper and Paper Stock

Giving Manifests of New York, Boston, Philadelphia and Other Ports of Newsprint, Wrapping, Writing, Coated, Blotting, Tissue, Strawboard, Wallboard, Cigarette Papers, Sulphite, Kraft and Ground Wood Pulp.

NEW YORK IMPORTS

WEEK ENDING JULY 22, 1939

SUMMARY

Cigarette paper .....548 cs.
Wall paper .....12 cs.
Wall board .....7 bdls.
Newsprint .....140 bls., 15,674 rolls
Printing paper .....50 rolls, 28 cs.
Wrapping paper .....154 rolls, 14 cs.
Filter paper .....76 bls., 22 cs.
Surface coated paper.....145 cs.
Surface baryta coated paper.....7 cs.
Decalcomanias .....21 cs.
Decalcomania paper .....36 cs.
Transfer pictures.....4 cs.
Tracing cloth .....27 cs.
Tissue paper .....6 cs.
Paper tubes ..... 48 cs.
Cardboard .....13 cs.
Miscellaneous paper.....3 bls., 9 cs.

CIGARETTE PAPER

H. H. Strauss, *Pipestone County,* Bordeaux, 14 cs.
Champagne Paper Corp., *Pipestone County,* Havre, 312 cs.
American Tobacco Co., *San Pedro,* Havre, 220 cs.
De Manduit Paper Corp., *Ile de France,* Havre, 2 cs.

WALL PAPER

Penson & Co., *Britannic,* London, 1 cs.
F. Blank & Co., *Manhattan,* Havre, 9 cs.
———, *Hamburg,* Hamburg, 2 cs.

WALL BOARD

H. G. Craig & Co., Inc., *Donpaco,* Donnacona, 7 bdls.

NEWSPRINT

Pagel Horton & Co., Inc., *Bergensfjord,* Skien, 470 rolls.
———, *Bergensfjord,* Oslo, 290 rolls.
———, *Pr. Roosevelt,* Norway, 194 rolls.
———, *Transylvania,* Glasgow, 216 rolls.
N. Y. Evening Journal, *Markland,* Liverpool, N. S., 550 rolls.
N. Y. Tribune, *Markland,* Liverpool, N. S., 1,514 rolls.
World Telegram, *Markland,* Liverpool, N. S., 592 rolls.
Brooklyn Daily Eagle, *Markland,* Liverpool, N. S., 426 rolls.
News Syndicate Co., Inc., *Brand,* Comeau Bay, 7701 rolls.
International Paper Co., *G.T.D.,* Gatineau, 332 rolls.
H. G. Craig & Co., Inc., *Donpaco,* Donnacona, 235 rolls
International Paper Co., *International #1,* Gatineau, 376 rolls.
H. G. Craig & Co., Inc., *A.C.D.,* Donnacona, 227 rolls.
Walker Goulard Plehn Co., Inc., *Scanstates,* Kotka, 140 bls.
H. G. Craig & Co., Inc., *Kermic,* Donnacona, 280 rolls.
Jay Madden Corp., *Manhattan,* Finland, 38 rolls.
———, *N. Amsterdam,* Rotterdam, 214 rolls.
———, *L. A. Christensen,* Port Alfred, Que., 1,220 rolls.
Perkins Goodwin & Co., *Hamburg,* Hamburg, 286 rolls.
Jay Madden Corp., *Hamburg,* Finland, 513 rolls.

PRINTING PAPER

Jay Madden Corp., *Scanstates,* Kotka, 8 rolls.
N. Y. World's Fair, *Jean Jadot,* Antwerp, 4 cs.
Dingelstedt & Co., *Bremen,* Bremen, 42 rolls, 21 cs.
R. J. Saunders & Co., *Ile de France,* Havre, 3 cs.

WRAPPING PAPER

Jay Madden Corp., *Scanstates,* Rauma, 98 rolls.
Jay Madden Corp., *Scanstates,* Kotka, 56 rolls.
F. C. Strype, *Jean Jadot,* Antwerp, 14 cs.

FILTER PAPER

H. Reeve Angel & Co., Inc., *Pr. Roosevelt,* Havre, 10 cs.
J. Manheimer, *Queen Mary,* Southampton, 76 bls., 1 cs.
H. Reeve Angel & Co., Inc., *Britannic,* London, 11 cs.

SURFACE COATED PAPER

Gevaert Co., of America, *Westernland,* Antwerp, 145 cs.

SURFACE BARYTA COATED PAPER

Atlantic F'd'g Co., *Hamburg,* Hamburg, 7 cs.

DECALCOMANIAS

Sellers Transportation Co., *Bremen,* Bremen, 4 cs.
General Motors Overseas Operations, *Bremen,* Bremen, 17 cs.

DECALCOMANIA PAPER

B. F. Drakenfeld & Co., *Scythia,* Liverpool, 34 cs. (duplex), 2 cs. (simplex).

TRANSFER PICTURES

Rohner Gehrig & Co., *Bremen,* Bremen, 4 cs.

TRACING CLOTH

E. Dietzgen & Co., *Scythia,* Liverpool, 13 cs.
Keuffel & Esser Co., *Scythia,* Liverpool, 14 cs.

TISSUE PAPER

W. J. Byrnes & Co., *American Trader,* London, 1 cs. (coated).
Dingelstedt & Co., *Scythia,* Liverpool, 5 cs.

PAPER TUBES

———, *Hamburg,* Hamburg, 48 cs.

CARDBOARD

E. Dietzgen & Co., *American Trader,* London, 2 cs.
Coty Processing Co., *Ile de France,* Havre. 8 cs.
Massce & Co., *Ile de France,* Havre, 3 cs.

MISCELLANEOUS PAPER

H. Reeve Angel & Co., Inc., *Goyo Maru,* Yokohama, 9 cs.
Walker Goulard Plehn Co., Inc., *N. Amsterdam,* Rotterdam, 2 bls.
Stern Stiner Co., *Ile de France,* Havre, 1 ble.

RAGS, BAGGINGS, ETC.

W. J. Green Co., Inc., *Pipestone County,* Bordeaux, 19 bls. rags.
Fort Dupee Sawyer Co., *Pipestone County,* Bordeaux, 11 bls. rags.
E. J. Keller Co., Inc., *Pipestone County,* ———, 47 bls. rags.
Manufacturers Trust Co., *Ragnhild,* London, 8 bls. rags.
Chase National Bank, *Ragnhild,* Rotterdam, 50 bls. bagging.
Irving Trust Co., *Pres. Hayes,* Bombay, 100 bls cotton waste.
Manufacturers Trust Co., *Scythia,* Liverpool, 93 bls. rags.
Public National Bank Trust Co., *Scythia,* Liverpool, 13 bls. rags.
———, *Scythia,* Liverpool, 24 bls. rags.
Banco Com'l Italiane Trust Co., *Express,* Thessaloniki, 84 bls. rags.
Loumar Textile By Products, Inc., *Black Condor,* Antwerp, 62 bls. bagging.
Chase National Bank, *Jean Jadot,* Antwerp, 6 bls. oil bag scrap, 137 bls. jute cloth cuttings.
G. W. Millar & Co., Inc., *Capulin,* Glasgow, 68 bls. waste paper.
R. & V. Miller, Inc., *N. Amsterdam,* Rotterdam, 12 bls. rags.
———, *N. Amsterdam,* Rotterdam, 17 cases wastepaper.

GLUE STOCK

Darmstadt Scott & Courtney, *N. Amsterdam,* Rotterdam, 151 bls.

OLD ROPE

———, *Barbarigo,* Trieste, 73 rolls.

WOOD PULP

Perkins Goodwin & Co., *Bergensfjord,* Drammen, 125 bls. bleached sulphite.
E. M. Sergeant Pulp & Chemical Co., *Bergensfjord,* Nygard, 125 bls. dry chemical pulp.

The Borregaard Co., Inc., *Bergensfjord,* Sarpsborg, 504 bls. unbleached sulphate.
———, *Bergensfjord,* Sarpsborg, 150 bls. bleached sulphite.
A. Giese & Son, *Noordam,* Rotterdam, 4 cases wood pulp.
Castle & Overton, Inc., *Astra,* Tallinn, 1690 bls. sulphate, 264 tons.
———, *Astra,* Tallinn, 2560 bls. sulphate, 430 tons; 195 bls. sulphite, 25 tons.
———, *Astra,* Gdynia, 1947 bls. wood pulp, 325 tons.
———, *Astra,* Riga, 1524 bls. unbleached sulphite, 304 tons.
Pulp Sales Corp., *Scanstates,* Kotka, 508 bls. mechanically ground pulp, 99 tons; 750 bls. sulphate, 150 tons; 175 bls. bleached sulphite, 29 tons.
Bulkley Dunton Pulp Co., Inc., *Scanstates,* ———, 180 bls. dry sulphite, 30 tons.
Castle & Overton, Inc., *Barbarigo,* Trieste, 167 bls. wood pulp.
D. M Hicks, Inc., *Jean Jadot,* Antwerp, 102 bls. wood pulp.

WOOD PULP BOARDS

Jay Madden Corp., *Scanstates,* Kotka, 163 rolls, 104 pkgs, 63 tons.

ALBANY IMPORTS

WEEK ENDING JULY 22, 1939

Price & Pierce, Ltd., *Topeka,* ———, 1375 bls. bleached sulphite.

PORTLAND IMPORTS

WEEK ENDING JULY 22, 1939

———, *Astra,* Riga, 1016 bls. unbleached sulphite, 203 tons.

BOSTON IMPORTS

WEEK ENDING JULY 22, 1939

Gottesman & Co., Inc., *Kersten Miles,* Sweden, 540 bls. wood pulp.
———, *Barbarigo,* Trieste, 200 bags bone glue sheets.
Price & Pierce, Ltd., *Hammaren,* ———, 4200 bls. unbleached sulphite, 1350 bls. unbleached sulphate.
Parsons & Whittemore, Inc., *Aachen,* ———, 1585 bls. wood pulp.

PHILADELPHIA IMPORTS

WEEK ENDING JULY 22, 1939

Gottesman & Co., Inc., *Consul Corfitzon,* Sweden, 125 bls. wood pulp.
E. J. Keller Co., Inc., *Pipestone County,* ———, 135 bls. rags.
Keer Maurer Co., *Ragnhild,* London, 205 coils old rope.
———, *Ragnhild,* London, 16 bls. rags.
———, *Ragnhild,* Rotterdam, 7 bls., 92 bags oil bag scrap.
Darmstadt Scott & Courtney, *Ragnhild,* Antwerp, 66 bls. bagging.
J. M. Hagy Waste Works, *Ragnhild,* Antwerp, 53 bls. rags.
Philadelphia Record, *Markland,* Liverpool, N. S., 1224 rolls newsprint.
———, *Scanstates,* Rauma, 295 rolls newsprint.
Pulp Sales Corp., *Scanstates,* Kotka, 250 bls. bleached sulphate, 50 tons; 210 bls. bleached sulphite, 42 tons.
J. W. Hampton, Jr. & Co., Inc., *Scanstates,* Kotka, 111 rolls newsprint.
Pulp Sales Corp., *Scanstates,* Helsingfors, 130 bls. mechanically ground pulp.
Neidich Process Co., *Scanstates,* Helsingfors, 179 bbls., 1 cs. tissue paper.
———, *Scanstates,* Stockholm, 120 bls. dry sulphite, 20 tons.
———, *Barbarigo,* Trieste, 500 bls. wood pulp.
Drueding Bros., Co., *Barbarigo,* Genoa, 10 cs. tissue paper caps.

WILMINGTON IMPORTS

WEEK ENDING JULY 22, 1939

Price & Pierce, Ltd., *Milos,* ———, 4950 bls. unbleached sulphite.
Price & Pierce, Ltd., *Consul Corfitzon,* ———, 4500 bls. unbleached sulphite.

BALTIMORE IMPORTS

WEEK ENDING JULY 22, 1939

Gottesman & Co., Inc., *Consul Corfitzon,* Sweden, 7410 bls. wood pulp.
Congoleum Nairn Co., *Pipestone County,* Bordeaux, 234 bls. rags.
Pulp Sales Corp., *Scanstates,* Rauma, 2160 bls. mechanically ground pulp.
F. H. Shallus Co., *Scanstates,* Kotka, 167 bls. newsprint.
Pulp Sales Corp., *Scanstates,* Kotka, 490 bls. bleached sulphite, 81 tons.
Pulp Sales Corp., *Scanstates,* Helsingfors, 260 bls. mech. ground pulp, 52 tons.
———, *Scanstates,* Stockholm, 210 bls. dry sulphite, 35 tons.
Bulkley Dunton Pulp Co., Inc., *Scanstates,* ———, 120 bls. dry sulphite, 20 tons.
Price & Pierce, Ltd., *Consul Corfitzon,* ———, 900 bls. unbleached sulphite.
Pagel Horton & Co., Inc., *Schwanheim,* Sweden, 9300 bls. wood pulp.

NORFOLK IMPORTS

WEEK ENDING JULY 22, 1939

H. H. Strauss, *Pipestone County,* Bordeaux, 124 cs. cigarette paper.
R. J. Reynolds Tobacco Co., *Pipestone County,* St. Nazaire, 1473 cs. cigarette paper.
Parsons & Whittemore, Inc., *Pipestone County,* Havre, 42 rolls newsprint.
Darmstadt Scott & Courtney, *Black Condor,* Antwerp, 74 bls. bagging.

NEWPORT NEWS IMPORTS

WEEK ENDING JULY 22, 1939

Gottesman & Co., Inc., *Texas,* Sweden, 3665 bls. wood pulp.
De Manduit Paper Corp., *Pipestone County,* Havre, 531 cs. cigarette paper.

JACKSONVILLE IMPORTS

WEEK ENDING JULY 22, 1939

Pagel Horton & Co., Inc., *Trafalgar,* Norway, 328 rolls newsprint.

DETROIT IMPORTS

WEEK ENDING JULY 22, 1939

Pagel Horton & Co., Inc., *Ornefjell,* Norway, 336 rolls newsprint.

MONTREAL IMPORTS

WEEK ENDING JULY 22, 1939

Pagel Horton & Co., Inc., *Dalveen,* Sweden, 15745 bls. wood pulp.

Germany Uses More Waste Paper

Waste paper is being used in Germany to an increasing extent as raw material in the manufacture of paper and cardboard, according to a report from Consul J. C. Hudson, Berlin, made public by the Department of Commerce.

Approximately 800,000 tons of waste paper were remanufactured into these items, an increase of 100,000 tons over 1936 and 300,000 tons greater than in 1927, the report said.

The proportion of waste paper used in the total raw material consumption of the German paper industry increased from 12.6 per cent in recent years to 15 per cent in 1938. It is believed in the industry that waste paper consumption will continue to increase during 1939.

One ton of waste paper is estimated in Germany to result in the saving of about five cubic meters of wood, according to the report.

To Sell Daily News Penetration Tester

The sale of the Daily News Penetration Tester has been taken over by Testing Machines Inc., 462 W. 34th street, New York City.

New York Market Review

Office of the PAPER TRADE JOURNAL,
Wednesday, July 26, 1939.

Seasonal quiet in practically all wholesale markets has been reported during the current week. Reports from many leading manufacturers' representatives, jobbers, and general paper merchants, indicate that while the sales volume of most grades of paper and paper products has declined, volume is at a higher level than at this period last year. In general, the distribution of paper is from 8 to 15 per cent higher at this date than at this period last year.

The index of general business activity rose to 80.9 per cent for the week ended July 15, from 86 per cent for the previous week, compared with 81.6 per cent for the corresponding period in 1938.

Paper production of some 215 mills for the week ended July 15 was estimated at 78.8 per cent, compared with 48.6 per cent for the previous week, and compared with 58.9 per cent for the week ended July 16, 1938. Paper board production for the week ended July 15 was 71.0 per cent, compared with 60.0 per cent for the corresponding period last year.

No important change in the newsprint situation has been reported during the current week. The latest figures indicate that consumption is increasing slowly. The average number of pages printed in the daily editions of papers in this country for June was 27 pages, which was the same as last May, and compared with 26 pages for June 1938. The Sunday editions for June averaged 82 pages, compared with 86 pages for last May, and with 80 pages last year. Newspaper advertising increased 6.8 per cent, periodical advertising 17.0 per cent and radio advertising 17.1 per cent in June.

Sales volume in the lower grades of sulphite papers and some grades of groundwood papers are apparently in better demand at this date. Kraft paper production and shipments are running a little below level of last year at this date. No change in representative quoted market prices has occurred to date, but the price structure is rather weak and some price cutting is reported in the grocery bag and also to a lesser extent in the wrapping grades of kraft.

Paper board production and sales are about up to expectations in the trade and prospects are good for the future.

Mechanical Pulp

The market situation in mechanical pulp is reported as unchanged from conditions prevailing last week. Prices, while not very firm, continue unchanged and little if any change is expected in the trade in the near future.

Chemical Pulp

No important change in prices or in the market situation of chemical pulp has been reported at this date. Prices of unbleached sulphite continue strong, while bleached sulphite and kraft pulps continue rather weak. No change from current, prevailing prices are expected in the trade despite a few unconfirmed reports to the contrary.

Old Rope and Bagging

Although reports are current in the trade that only a limited supply of old rope is available, mills are buying in small lots and report current needs are covered. Prices continue steady and the market reflects little activity at this date. Demand for old bagging continues limited. Prices are unchanged at prevailing market quotations.

Rags

The market situation on the high grades of new white rags continues firm and no important change in any grade of paper making rags has been reported at this date.

Old Waste Paper

The expected rise in the prices on some grades of waste paper occurred last Wednesday, when prices on strictly folded news and on No. 1 mixed paper were revised upward. Strictly folded news is currently quoted at from .35 to .37½, and No. 1 mixed paper at from .22½ to .27½. Although dealer supplies of old corrugated are reported as small, no change in the prevailing market quotations on this grade has been reported to date.

Twine

No important change in prices or in the general market situation in twine has occurred this week. Trading is rather light but about equal to trade expectations at this period of the year. Representative quoted market prices on all grades of hard and soft fiber twines continue at prevailing levels.

Champion To Vote on Mill Project

HOUSTON, Tex., July 24, 1939—W. R. Crute, general manager of the Champion Paper and Fibre Company's pulp mill at Pasadena, returned last week from Hamilton, Ohio, where he went to confer with officials of his company regarding equipment for the proposed $3,000,000 paper mill to be erected alongside the plant.

Mr. Crute said there was nothing new concerning the construction of the big mill and that all definite commitments, both on construction and equipment, was being held in abeyance pending a meeting of stockholders of the company in Cincinnati August 8, at which time permission will be asked for the construction of the new Houston plant.

"Plans for construction of the mill are well along," Mr. Crute said. "Work on the plant, if a permit is given by the stockholders for its construction, will begin just as soon as we can get delivery on steel," he concluded.

The H. K. Ferguson Company are the engineers for the construction work.

Miscellaneous Markets

Office of the PAPER TRADE JOURNAL,
Wednesday, July 26, 1939.

BLANC FIXE—Prices on blanc fixe continue firm and unchanged at prevailing market quotations. The pulp is quoted at from $42.50 to $45 per ton, in bulk; the powder is offered at from 3½ to 3¾ cents per pound, in barrels, at works.

BLEACHING POWDER—Quotations on bleaching powder remain firm and conform to prevailing market prices. Bleaching powder is quoted at from $2 to $2.25 per 100 pounds, in drums, at works.

CASEIN—The demand for casein is reported good for the week, with only fractional changes in prices. Standard domestic casein, 20-30 mesh, is currently quoted at from 10½ to 10¾ cents per pound; 80-100 mesh, at from 11 to 11¼ cents per pound; all prices in bags, car lot quantities.

CAUSTIC SODA—Prices on caustic soda continue firm and unchanged at prevailing market quotations. Solid caustic soda is quoted at from $2.10 to $2.30 per 100 pounds; flake and ground at from $2.50 to $2.70 per 100 pounds, in drums, at works.

CHINA CLAY—Quotations on china clay continue firm and remain unchanged at prevailing market levels. Domestic filler clay is quoted at from $6.50 to $12 per ton; coating clay at from $11 to $22 per ton, at mines. Imported clay is offered at from $13 to $25 per ton, ship side.

CHLORINE—Prices on chlorine continue firm and conform to prevailing market quotations. Chlorine is currently quoted at $1.75 per 100 pounds, in single-unit tank cars, f.o.b., works.

ROSIN—The rosin market is reported as firm at this date and prices on some grades are a little higher. "G" gum rosin is currently quoted at $4.95; "FF" rosin at $4.50, per 280 pounds, gross weight, in barrels, at Savannah. Seventy per cent gum rosin size is quoted at $2.74 per 100 pounds, f.o.b., shipping point.

SALT CAKE—Prices on salt cake continue firm and are reported unchanged at prevailing market quotations. Prices range at from $12 to $13.50 per ton; chrome salt cake at from $11 to $12 per ton, f.o.b., shipping point. Imported salt cake is quoted at from $14.50 to $15 per ton, Gulf or Atlantic Seaboard, on dock.

SODA ASH—Quotations on soda ash continue firm and unchanged at prevailing market levels. Prices on soda ash in car lots, at works, per 100 pounds, are as follows: in bulk, $.90; in bags, $1.05; and in barrels, $1.35.

STARCH—The demand for corn starch is reported as good, while the corn market is weak under the prospect of the largest corn crop in many years. Globe pearl is currently quoted at $2.50 per 100 pounds; special paper starch at $2.60 per 100 pounds. All prices in bags, car lot quantities, f.o.b., Chicago.

SULPHATE OF ALUMINA—Quotations on sulphate of alumina are unchanged at prevailing market levels. The commercial grades are offered at $1.15; iron free at $1.30 per 100 pounds, in bags, car lot quantities, f.o.b., works.

SULPHUR—Prices on sulphur continue firm and unchanged. Annual contracts are quoted at $16 per long ton, f.o.b., mines. Spot and nearby car lots are offered at $19 per ton.

TALC—Quotations on talc are unchanged and conform to prevailing market levels, with demand good at this date. Domestic talc is currently quoted at from $15 to $18 per ton, Eastern mines. Imported talc is offered at from $20 to $40 per ton, on dock.

Market Quotations

Paper

(Delivered New York)

News, per ton—
Roll, contract....$50.00 @ —
Sheets .....58.00 @ —

Kraft—per cwt.—Delivered Zone A
No. 1 Northern....$4.75 @$5.25
Superstandard .... 4.12½ @ 4.62½
Northern Standard Wrapping ..... 4.00 @ —
Standard Wrapping 3.50 @ —

Tissues—Per Ream—Carlots
White No. 1.....$0.82½ @ —
White No. 1 M. G. .80 @ —
White No. 1½.... .67½ @ —
White No. 2..... .60 @ —
Anti-Tarnish M. G. .65 @ —
Colored ..... .77½ @ —
Kraft ..... .65 @ —
Manila ..... .60 @ —
Unbl. Toilet, 1 M.. 2.65 @ —
Bleached Toilet.... 5.26 @ —

Paper Towels—Per Case
Unbleached, Jr.....$1.75 @ —
Bleached Jr..... 3.10 @ —

Manila—per cwt.—C. l. f. a.
No. 1 Jute..... 7.75 @ 9.75
No. 1 Manila Wrapping, 35 lb..... 5.00 @ —
No. 2 Manila Wrapping, 35 lb..... 4.75 @ —

Boards, per ton—
News .....30.00 @32.50
Chip .....30.00 @32.50
Sgl. Mla. Lt. Chip.42.50 @ —
Jute Lined Chip...42.50 @45.00
White Pat. Coated.55.00 @57.50
Kraft Liners.....45.00 @ —
Binders Boards....71.00 @77.00

The following are representative of distributors' resale prices:

Rag Content Bonds and Ledgers—
White, Assorted Items,
Delivered in Zone 1:

	Bonds		Ledgers	
100% Rag Ext. No. 1.	$39.10 @	$46.00	$40.25 @	$47.25
100% Rag	31.05 @	36.50	32.20 @	37.75
85% Rag	.....		29.90 @	35.00
75% Rag	23.60 @	27.75	24.75 @	29.00
65% Rag	.....		21.65 @	26.25
50% Rag	17.55 @	21.50	18.70 @	22.75
45% Rag	14.65 @	17.75	15.80 @	19.25

Colors at $1.00 cwt. extra.

Sulphite Bonds and Ledgers—
White, Assorted Items,
Delivered in Zone 1:

	Bonds		Ledgers	
No. 1...	$8.60 @	$10.50	$9.75 @	$12.00
No. 2...	7.70 @	9.50	8.90 @	10.75
No. 3...	6.75 @	8.25	7.90 @	10.00
No. 4...	7.00 @	8.50	8.20 @	10.00

Colors $1.00 cwt. extra.

Free Sheet Book Papers—
White, Cased Paper,
Delivered in Zone 1:

No. 1 Glossy Coated...	$11.30 @	$12.75
No. 2 Glossy Coated...	9.70 @	11.00
No. 3 Glossy Coated...	8.60 @	10.00
No. 4 Glossy Coated...	8.05 @	9.25
No. 1 Antique (watermarked)	8.05 @	9.25
No. 2 Offset.....	7.45 @	8.50
A Grade E. F.....	7.20 @	8.25
A Grade S. & S. C....	7.45 @	8.50
B Grade E. F.....	6.65 @	7.75
B Grade S. & S. C....	6.90 @	8.00
C Grade E. F.....	6.40 @	7.50
C Grade S. & S. C....	6.65 @	7.75
D Grade E. F.....	6.10 @	7.00
D Grade S. & S. C....	6.35 @	7.25

Ivory & India at $.50 cwt. extra.

Mechanical Pulp

(On Dock, Atlantic Ports)

No. 1 Imported—
Moist .....22.50 @24.00
Dry .....22.50 @24.00

(Delivered)

No. 1 Domestic and Canadian .....29.00 @31.00

Chemical Pulp

(On Dock, Atlantic, Gulf and West Coast Ports)

Bleached Sulphite (Domestic and Foreign)—
Prime Bleached Sulphite ..... 2.25 @ 2.75

Prime Qualities—
Easy-Bleaching Sulphite ..... 1.90 @ 2.00
Strong Unbleached Sulphite ..... 1.70 @ 1.90

(On Dock, Atlantic Ports)

Kraft Bleached..... 2.50 @ 2.75
Kraft Light & Strong 1.50 @ 1.60
Kraft No. 1..... 1.40 @ 1.50
Kraft No. 2..... 1.25 @ 1.30

(F. o. b. Pulp Mill)

Kraft Domestic..... 1.85 @ 1.95

(Delivered)

Soda Bleached..... 2.55 @ —

Add 60 cents per short ton, dock charges for Albany; $2.50 for Lake Ports East and $3.50 for Lake Ports West of Mackinac Straits.

Domestic Rags

New Rags

(Prices to Mill f. o. b. N. Y.)

Shirt Cuttings—
New White, No. 1 6.90 @ 7.00
Silesias No. 1..... 4.50 @ 4.75
New Unbleached... 6.75 @ 7.00
Blue Overall..... 4.90 @ 5.00
Fancy ..... 1.75 @ 2.00
Washables ..... 1.50 @ 1.60
Mixed Khaki Cuttings ..... 2.25 @ 2.50
O. D. Khaki Cuttings 3.25 @ 3.40

Old Rags

White, No. 1—
Repacked ..... 2.90 @ 3.15
Miscellaneous ..... 2.10 @ 2.35

White, No. 2—
Repacked ..... 1.50 @ 1.60
Miscellaneous .... 1.25 @ 1.40

Thirds and Blues—
Repacked ..... 1.30 @ 1.40
Miscellaneous ..... 1.15 @ 1.20

Roofing Rags—
No. 1..... .90 1.00
No. 2..... .67½ @ .77½
No. 3 (bagging).. .55 @ .65
No. 4..... .60 @ .65
No. 5A..... .60 @ .65

Foreign Rags

New Rags

New Dark Cuttings.. 2.25 @ 2.40
New Mixed Cuttings. 2.00 @ 2.20
New Light Silesias.. 5.50 @ 5.75
Light Flannelettes... 5.50 @ 5.75
New White Cuttings. 7.00 @ 7.25
New Light Oxford.. 4.00 @ 4.50
New Light Prints... 3.00 @ 3.25

Old Rags

No. 1 White Linens. 7.50 @ 8.50
No. 2 White Linens. 6.50 @ 7.50
No. 3 White Linens. 4.50 @ —

HIGHEST QUALITY CLAYS

LUMP and POWDERED } IMPORTED

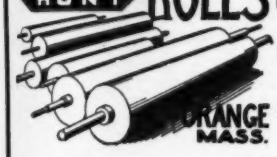
PAPER MAKERS IMPORTING CO. INC. EASTON, PENNSYLVANIA, U.S.A.

DOMESTIC { CRUDE CRUSHED AIR FLOATED WATER WASHED

PRECIPITATED CALCIUM CARBONATE

RODNEY HUNT

ROLLS for PAPER MILLS



"Shaf-Tite" Felts in Wood - Rubber - Metal Pipe Rolls

ORANGE MASS. Low in Cost— High in Service

ALSO

Water Power Machinery — Canal Gates

Variable Speed Drives

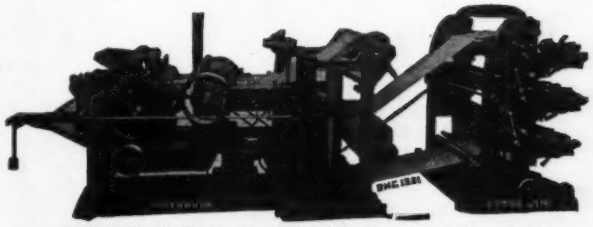
Tanks, Vats — Endless Felt Washers

RODNEY HUNT MACHINE CO.

ORANGE — 38 Maple St. — MASS.

BAG MAKERS REPORT—

"HOURS SAVED IN CHANGE OVER"



PMC 1591. Aniline web printing "Century Line" flat and square bag machine. Equipped with change-over time-reduction features. Vertical bottom-forming-drum delivery simplifies setting up and operation. Elimination of many unnecessary parts speeds adjustment.

Reports like these assure us that the POTDEVIN "Century Line" bag machines have "clicked" with bag manufacturers.

For "hours saved in changeover" gives users an extra "margin of safety" in which to operate.

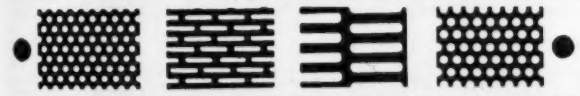
POTDEVIN PAPER BAG MACHINERY

PRINTING, WAXING, CONVERTING MACHINERY

POTDEVIN MACHINE CO.

1223 38th Street, Brooklyn, New York

SCREENS of Perforated Metal



The Harrington & King PERFORATING Co.

5652 Fillmore St., Chicago, Ill. 114 Liberty St., New York, N.Y.

WATERBURY FELTS

Are Made By

H. WATERBURY & SONS CO.

ORISKANY, NEW YORK

CLEAN CUT

LANGSTON SLITTERS AND ROLL WINDERS

for every job from tissue to heavy board . . . narrow to wide cuts . . . small to large diameters.

SAMUEL M. LANGSTON CO., Camden, N. J.

SHEAR CUT

No. 4 White Linens.	2.25	@	3.25
No. 1 White Cotton.	4.25	@	4.75
No. 2 White Cotton.	3.25	@	3.75
No. 3 White Cotton.	2.50	@	3.00
No. 4 White Cotton.	1.90	@	2.20
Extra Light Prints..	2.00	@	2.40
Ord. Light Prints...	1.75	@	2.15
Med. Light Prints...	1.55	@	1.95
Dutch Blue Cottons.	2.25	@	2.50
French Blue Linens..	3.00	@	—
Checks and Blues...	2.00	@	—
Linsey Garments....	1.90	@	2.00
Dark Cottons.....	1.50	@	1.60
Old Shopperies.....	1.30	@	1.45
New Shopperies.....	1.45	@	1.50
French Blues.....	2.25	@	2.50

Old Rope and Bagging

(Prices to Mill, f. o. b. N. Y.)

Gunny No. 1—			
Foreign	1.75	@	1.90
Domestic	1.75	@	1.80
Wool Tares, light...	1.60	@	1.70
Wool Tares, heavy..	1.80	@	1.90
Bright Bagging.....	1.60	@	1.70
Manila Rope—			
Foreign	2.60	@	2.75
Domestic	2.75	@	3.00
Jute Threads.....	3.00	@	3.25
Sisal Strings	1.50	@	1.60
Mixed Strings....	.55	@	.60

Old Waste Papers

(F. o. b. New York)

Shavings—			
White Envelope Cuttings	2.30	@	2.40
Ordinary Hard White No. 1....	1.90	@	2.00
Soft White No. 1..	1.60	@	1.75
Soft White Extra..	2.25	@	2.40
Flat Stock—			
Stitchless	.80	@	.85
Overissue Mag ...	.70	@	.75
Solid Flat Book....	.55	@	.60
Crumbled No. 1....	.40	@	.45
Ledger Stock White.	1.05	@	1.15
Ledger Stock Colored	.60	@	.70
New B. B. Chips....	.15	@	.20
Manila—			
New Env. Cut....	1.40	@	1.50
New Cuttings.....	1.00	@	1.20
Old Kraft Machine—			
Compressed bales..	.60	@	.65
News—			
No. 1 White News	1.25	@	1.30
Strictly Overissue.	.40	@	.45
Strictly Folded....	.35	@	.37½
No. 1 Mixed Paper..	.22½	@	.27½

Twines

(F. o. b. Mill)
(Soft Fiber)

Coarse Polished—			
India	.12¾	@	.14¾
White Hemp.....	.13¾	@	.15¾
Fine Polished—			
Fine India.....	.16	@	.18
Unpolished—			
Box	.09½	@	—
Paper Makers.....	.09½	@	.10½
Tube Rope.....	.10¾	@	.12½
Wall Paper.....	.10¾	@	.12½
Wrapping	.12	@	—
Soft Fiber Rope...	.12	@	.14
Cotton	.16	@	.19
(Hard Fiber)			
Medium Java.....	.11	lb	.17
Mex. Sisal.....	.10	@	.16
Manila	.16	@	.23

Domestic	2.65	@	2.75
Sisal Rope	1.75	@	1.85
Mixed Rope.....	.45	@	.50
Transmission Rope..	1.80	@	1.90
Soft Jute Rope	2.00	@	2.25
Jute Carpet Threads.	.75	@	.90
Gunny Bagging—			
Foreign	1.50	@	1.65
Domestic	1.40	@	1.50
Bleachery Burlap....	2.50	@	2.70
Gunny Bagging.....	1.45	@	1.60
Scrap Burlap—			
Foreign	1.35	@	1.40
Domestic	1.25	@	1.40
Scrap Sisal.....	1.55	@	1.60
Scrap Sisal for Shredding	1.75	@	1.80
Wool Tares, Heavy..	1.40	@	1.50
New Burlap Cuttings	2.00	@	2.25
Aust. Wool Pouches.	1.60	@	1.90
Heavy Baling Bagging	1.50	@	1.60
Paper Mill Bagging..	.85	@	1.00
No. 2 Bagging.....	.45	@	.50

Domestic Rags (New)

(F. o. b. Boston)

Shirt Cuttings—			
New Light Prints...	.03¼	@	.03½
New White No. 1....	.0675	@	.0690
New Light Flannelettes	.05	@	—
Silesias No. 1.....	.04	@	.04¼
New Black Silesias..	.03½	@	.03¾
Soft Unbleached.....	6.50	@	7.00
Blue Cheviots.....	.05	@	.05¼
Fancy	.02	@	.02½
Washable	.02	@	.02½

Cottons—According to grades—			
Blue Overalls.....	.04¼	@	.05
New Black, soft...	.03¼	@	.04
Khaki Cuttings.....	.02½	@	.03
O. D. Khaki.....	.03	@	.03¼
Corduroy	.02¾	@	.03
New Canvas.....	.06¾	@	.07¼
B. V. D. Cuttings...	.06¾	@	.07

Domestic Rags (Old)

(F. o. b. Boston)

Canvas	.04¼	@	—
White No. 1—			
Repacked	—	@	2.75
Miscellaneous	2.50	@	2.75
White No. 2—			
Repacked	1.90	@	2.00
Miscellaneous	2.00	@	2.25
Twos and Blues.....	1.75	@	2.00
Old Blue Overalls...	1.50	@	—
Thirds and Blues—			
Repacked	1.37½	@	1.75
Miscellaneous	1.25	@	1.62½
Black Stockings.....	3.90	@	4.00
Roofing Stock—			
No. 1.....	1.00	@	1.10
No. 2.....	.65	@	.70
No. 3.....	.45	@	.50

Foreign Rags

(F. o. b. Boston)

Dark Cottons.....	.90	@	1.05
Dutch Blues.....	2.65	@	2.75
New Checks and Blues	2.85	@	3.00
Old Fustians.....	2.25	@	2.50
Old Linsey Garments.	2.10	@	2.25
New Silesias.....	3.75	@	4.00

PHILADELPHIA

Domestic Rags (New)

(Price to Mill, f. o. b. Phil.)

Shirt Cuttings—			
New White, No. 1.	.06	@	.06½
New White, No. 2.	.03½	@	.04
Light Silesias.....	.03½	@	.04
Silesias, No. 1....	—	@	.04½
Black Silesias, soft	—	@	.03
New Unbleached..	.05½	@	.06
Washable, No. 1..	.01½	@	.01¾
Blue Overall.....	.04	@	.04½
Cottons—According to grades—			
Washable No. 2...	.01	@	.01¼
New Blue.....	.01	@	.01¼
Fancy Percales...	—	@	.02½
New Black Soft...	.03	@	.03½
New Light Seconds	—	@	.04½
New Dark Seconds	.50	@	.75
Khaki Cuttings—			
No. 1 O. D.....	.03	@	.03½
No. 2 Mixed.....	.02	@	.02½
Corduroy	—	@	.02
New Canvas.....	.05	@	.05½
New Black Mixed.	.02½	@	.02¾

Domestic Rags (Old)

White No. 1—			
Repacked	2.75	@	3.00
Miscellaneous	2.00	@	2.25
Thirds and Blues—			
Miscellaneous	1.00	@	1.25
Repacked	1.50	@	1.75
Black Stockings (Export)	3.00	@	3.50
Roofing Stock—			
Foreign No. 1.....	.90	@	1.10
Domestic No. 1...	.80	@	.90
Domestic No. 2...	.60	@	.65
Roofing Bagging...	.40	@	.45

Bagging

(F. o. b. Phila.)

Gunny, No. 1—			
Foreign	—	@	1.50
Domestic	1.50	@	1.60
Manila Rope.....	—	@	3.00
Sisal Rope.....	1.50	@	1.75
Mixed Rope.....	.75	@	1.00
Scrap—			
No. 1.....	—	@	1.50
No. 2.....	.80	@	.90
Wool Tares, heavy..	3.25	@	3.50
Mixed Strings.....	.45	@	.50
No. 1 New Light Burlap	2.50	@	3.00
New Burlap Cuttings	1.75	@	2.00

Old Papers

(F. o. b. Phila.)

Shavings—			
No. 2 Hard White	2.25	@	2.30
No. 2 Hard White	1.90	@	2.00
No. 1 Soft White.	1.75	@	1.80
No. 2 Soft White.	1.30	@	1.40
No. 1 Mixed.....	.65	@	.75
Solid Ledger Stock..	1.45	@	1.50
Ledger Stock, white.	1.10	@	1.15
Ledger Stock, colored	.75	@	.80
No. 1 Books, heavy..	.60	@	.65
Manila Cuttings....	1.45	@	1.50
Print Manila.....	.45	@	.50
Container Manila...	.35	@	.40
Kraft Paper.....	.65	@	.70
No. 1 Mixed Paper..	.25	@	.30
Straw Board Chip...	.25	@	.30
Binders Board Chip.	.25	@	.30
Corrugated Board...	.50	@	.55
Overissue News.....	.45	@	.50
Old Newspapers.....	.35	@	.40

BOSTON

Old Papers

(F. o. b. Boston)

Shavings—			
No. 1 Hard White	2.25	@	2.50
No. 1 Soft White.	1.85	@	2.15
No. 2 Mixed.....	.75	@	.80
Solid Ledger Books..	1.30	@	—
Overissue Ledger Stock	1.30	@	1.50
Mixed Ledgers.....	.85	@	.90
No. 1 Books, heavy..	.70	@	—
No. 1 Books, light..	.65	@	.75
Crumpled Stitchless Book Stock.....	.55	@	.65
Manila Env. Cuttings	1.70	@	1.85
Manila Envelope Cuttings, Extra Quality	2.00	@	2.10
No. 1 Old Manila...	.65	@	.70
White Blank News..	1.30	@	1.40
No. 1 Kraft.....	.70	@	—
Mixed Papers.....	.15	@	.17½
Print Manila.....	.45	@	.55
Container Manilas..	.27½	@	—
Old Newspapers.....	.27½	@	.32½
Paper Wool Strings..	.60	@	.65
Overissue News.....	.45	@	.50
Box Board Chips....	.20	@	.25
Corrugated Boxes....	.30	@	.32½
Kraft corrugated boxes	.60	@	.65
Screening Wrappers.	.40	@	.45

Bagging

(F. o. b. Boston)

Manila Rope—			
Foreign	2.50	@	2.65

CHICAGO

Old Papers

(F. o. b. Chicago)

Shavings—			
No. 1 White Envelope Cuttings....	1.80	@	1.90
No. 1 Hard White.	1.70	@	1.80
No. 1 Soft White..	1.50	@	—
Ledger & Writings..	.75	@	.80
Solid Books.....	.45	@	.50
Blanks	.90	@	—
Krafts	.45	@	.50
New Kraft Cuts.....	1.10	@	—
Manila Env. Cuts...	Nominal		
Ex. No. 1 Manila...	Nominal		
Print Manila	Nominal		
Overissue News.....	.35	@	—
Old Newspapers—			
No. 1 Folded News	.25	@	.30
No. 1 Mixed Paper	.15	@	.20
Roofing Stocks—			
No. 1.....	1.00	@	1.05
No. 2.....	.85	@	—

TORONTO

Paper

Bonds

Direct mill shipment in two-ton lots

No. 1 White .....$	35.50	@	—
No. 1 Tints	36.50	@	—
No. 2 White	25.50	@	—
No. 2 Tints	26.50	@	—
No. 2 Golden Rod..	27.50	@	—
No. 3 White	21.00	@	—
No. 4 White	15.00	@	—
No. 4 Tints	16.00	@	—
No. 4 Golden Rod...	17.00	@	—
Direct mill shipment in three-ton lots			
No. 5 White .....$	10.50	@	—
No. 5 Tints	11.50	@	—
No. 5 Golden Rod..	12.00	@	—
No. 6 White	9.00	@	—
No. 6 Tints	9.50	@	—
No. 6 Golden Rod..	11.00	@	—
No. 7 White	8.00	@	—
No. 7 Tints	8.50	@	—
No. 7 Golden Rod..	10.00	@	—
Book—			
No. 1 M. F. ..... $	7.00	@	—
No. 2 M. F.	6.50	@	—
No. 3 M. F.	5.35	@	—
No. 1 S. C.	7.25	@	—
No. 2 S. C.	6.75	@	—
No. 3 S. C.	5.85	@	—

Coated Book & Litho

Ton Lots (resale)

No. 1 .....$	12.00	@	—
No. 2	10.25	@	—
No. 3	8.90	@	—
Coated tinted	13.00	@	—
Wrapping—delivered—			
Rag Brown.....	4.85	@	5.25
White Wrap.....	4.00	@	—
"B" Manila.....	4.90	@	6.15
No. 1 Manila.....	5.50	@	6.90
Fiber	5.50	@	6.90
Kraft No. 2.....	5.50	@	6.90

(F. o. b. Cars, Toronto)

News per ton—			
Rolls (contract)..$	46.00	@	—
Sheets .....$	54.00	@	—

Pulp

Ground wood.....$	29.00	@	—
Unbleached sulphite.	44.00	@	—
Bleached sulphite...	54.00	@	—
Kraft	50.00	@	—
Soda	54.00	@	—

Old Waste Paper

(In carload lots, f. o. b. Toronto)

Shavings—			
White Env. Cut...	2.00	@	—
Soft White.....	1.75	@	—
White Blk. News..	1.25	@	1.10
Book and Ledger—			
Flat Magazine and Book Stock (old)	.70	@	—
Light and Crumpled Book Stock.	.60	@	—
Ledgers and Writings	1.00	@	—
Manilas—			
New Manila Cut...	1.35	@	—
Printed Manilas...	.45	@	—
Kraft	.95	@	—
News and Scrap—			
Strictly Overissue..	.50	@	—
Strictly Folded....	.45	@	—
No. 1 Mixed Paper..	.30	@	—

Domestic Rags

(Price to Mills, f.o.b. Toronto)

No. 1 White Shirt Cuttings	.06½	@	.06¾
Light Prints.....	.03	@	.03¼